Indian Health Service
Office of Information Technology

RPMS Programming Standards and Conventions

September 2005

SUMMARY OF CHANGES

Date	Location	Change
05/18/05	2.2.1.7	**Added** "The version number incorporated into any patch name must be exactly the same as the application's version number. No extra trialing zeros will be allowed."
05/18/05	2.2.1.9	**Changed** "APCDALV routine" to "current visit creation API" **Added** "Documentation on this API can be found in the Developer Tools document."
05/18/05	2.2.1.10	**Added** new section "Use of Sensitive Patient Tracking with Patient Lookup"
05/18/05	2.2.2.1.3	**Changed** "who is currently responsible for maintenance and development of the package" to "(author) of the routine"
05/18/05	2.2.7.2	**Added** "with menu options"
05/18/05	2.2.12.5	**Added** new section "Assignment of Port Number for Interfaces"
05/18/05	2.2.13.7	**Added** new section "Data Dictionary Field Numbering Conventions"
06/02/05	10.0	**Added** new Appendix H
06/08/05	2.2.12.3.1	**Replaced** wording with "Any read from or write to data in another RPMS application will be made with a published API."
07/2005	Appendix F	**Revised** entire section to update style standards and **added** security section in technical manual.
07/2005	N/A	**Revised** entire document to new format
07/26/05	2.2.2.23	**Added** new section "Routine Source Code"
07/29/05	Appendix G	**Replaced** former appendix G with revised one from Horace and FJ.
08/05	Appendix F	**Revised** Appendix F
08/29/05	2.2.2.23	**Revised** to read "All RPMS applications must submit all source code for technical verification"
09/07/05	N/A	**Revised** document date to September 2005
09/07/05	2.2.1.9	**Changed** "Developer Tools" to "Developers' Handbook"
09/07/05	2.2.1.9	**Deleted** term DBIC
09/07/05	2.2.1.9	**Changed "**are accepted and documented by the DBIC and listed on the DBA menu on IHS Mail." to "are accepted by the DBA."
09/07/05	2.2.1.9	**Added "**VistA stands for **V**eterans Health **I**nformation **S**ystems and **T**echnology **A**rchitecture."
09/07/05	Chapter 1	**Changed** references from "SET" to "DIT".
09/07/05	2.2.1.9	**Replaced** membership list with **"**Membership consists of all Federal RPMS programmers in OIT, as approved by their Division Director, one representative from Software Quality Assurance and optionally one representative from the Area ISC Committee. The

Date	Location	Change
		number of members of the SACC can vary."
09/07/05	Appendix C	**Changed** title from "Unix/DOS" to "Unix/Windows".
09/07/05	Appendix E	**Added to introduction "**IHS is converting from NPIRS to a National Data Warehouse and the most recent documentation for exporting to the NDW is on our web page at: www.ndw.ihs.gov."

TABLE OF CONTENTS

1.0 Purpose, Policy, & The Standards and Conventions Committee

1.1 Purpose

The purpose of this document is to provide a cornerstone for all national software distributed throughout the Indian Health Service (IHS). Programming Standards and Conventions (SAC) mandate functional soundness and technical correctness of Resource & Patient Management System (RPMS) programs and all other programs that interface with RPMS. RPMS software includes programs written in M and other programming environments.

1.2 Policy

1.2.1 Conformance

All RPMS software developed for IHS will conform to the Programming SAC. In areas where specific IHS standards have yet to be adopted, software development will conform to accepted industry standards.

1.2.2 Quality Control

The IHS Programming SAC have been established as a key aspect of quality control under the Division of Information Technology (DIT), Office of Information Technology (OIT).

1.2.3 Definition/Appeal

The IHS Standards and Conventions Committee (SACC) defines Programming SAC and serves as the source of appeal when issues of conformity with Programming SAC arise.

1.2.4 Development

SACC members and other technical experts within IHS will participate in the development of Programming SAC in collaboration with public and private subject experts and with national and international standards organizations.

1.3 SACC Charter

1.3.1 Purpose

The Standards and Conventions Committee (SACC) was established to define and review national standards for software developed within the Indian Health Service (IHS). This applies to DIT efforts to modernize IHS systems, as well as to other OIT development for RPMS and to area and local facility development. The SACC will be responsible for promoting consistency in standards development by authoring the Programming Standards and Conventions (SAC) and the Graphical User's Interface Standards and Conventions (GUI SAC). The SACC is also to serve as an arbiter when issues of interpretation to SAC arise.

- Requests for exemptions from existing RPMS standards are made by the development community to the SACC via written or electronic media.
- A simple majority decision by the committee will be final regarding interpretation or waivers of the standards.

1.3.2 Mission

The mission of the SACC is to:

- Provide a cornerstone for all national software developed and distributed within Indian Health Service (IHS);
- Provide mandates for functional soundness and technical correctness of RPMS and all other programs written in the M programming language as well as RPMS programs written for the desktop environment;
- Provide a base of utilities and techniques for uniformity;
- To rule on disputes about the interpretations of the SAC; and
- To make recommendations on requests for SAC exemptions.

1.3.3 Responsibilities

a. The membership of the SACC shall include representatives from the Divisions of the OIT, as determined and approved by the respective Division Directors. The SACC may call upon individuals outside of its membership on an ad hoc basis as necessary to serve on focused work groups involved in SACC activities.

b. The SACC will report directly to the Director, DIT. Decisions and/or recommendations will be forwarded to the Director, DIT for approval.

c. The Chairperson of the SACC will forward a quarterly report detailing committee activities to the Director, DIT.

d. A committee member, selected by the entire SACC and approved by the Director, DIT, will chair the committee, organize agendas, and track action items.

e. SACC meetings will be held at least once a quarter via teleconference. These meetings shall be focused on updating the SAC document, processing requests for exemption, and issuing interpretations to clarify the SAC document. Other ad-hoc meetings to discuss specific assignments may be held as needed or at the request of the Chairperson or the Director, DIT.

f. The Director, DIT will sponsor the Standards and Conventions Committee, including approval of SACC recommendations.

g. SACC members and other technical experts within IHS will participate in the development of the Programming SAC in collaboration with public and private subject experts and with national and international standards organizations.

h. The Director, DIT is responsible for promulgating all programming SAC to IHS programmers via IHS MailMan and other electronic media (e.g., web pages).

i. Each Software Development Project Team Lead is responsible for assuring that programming SAC is followed.

1.3.4 Membership

Membership consists of all Federal RPMS programmers in OIT, as approved by their Division Director, one representative from Software Quality Assurance and optionally one representative from the Area ISC Committee. The number of members of the SACC can vary.

a. An alternate member may be appointed for each SACC member. An alternate does not have voting privileges unless the alternate is acting on behalf of the full member.

b. Membership period is unrestricted and is at the discretion of the Director, DIT in consultation with other OIT Division Directors.

c. The SACC will elect a chairperson to serve a 2-year term. The responsibilities of the chairperson role are to:

- Coordinate the establishment of new standards as needed;

- Coordinate standards revisions;
- Coordinate waiver and/or exemption requests; and
- Report committee decisions to the programming and OIT management communities.

1.4 SACC Procedures

1.4.1 Proposals for Changes

1.4.1.1 Proposals

If an individual identifies the need for a change in the SAC, a request must be made to the SACC either via written notification using the form in Appendix B or the SACC WebBoard. Proposals should be submitted as early as possible in the development cycle.

1.4.1.2 Proposal requests

Proposal requests should include the following information:

- Current section and wording
- Recommended change
- Justification and comments

1.4.1.3 SACC Review

After review of the need and impact of the proposed change, the Chairperson of the SACC will call for a vote on the request. A simple majority decision by the SACC shall be required to grant a change to the SAC.

1.4.1.4 Decision Notification

Notification of the decision of the SACC will be made to the individual requesting the change and will be forwarded to the Team Lead of OIT, where it will be processed as a new programming SAC.

1.4.2 New Programming SAC

1.4.2.1 Publication of Changes

The SACC will publish the proposed Programming SAC changes (either individual paragraph proposals or the entire document) onto the SACC WebBoard for comments at least 30 days prior to voting on the proposed changes.

1.4.2.2 Approval

After the SACC votes to accept the proposed Programming SAC, the SACC will forward it to the Director, DIT for approval. If the Director, DIT does not respond with approval/disapproval within 30 days from the day it is submitted to him/her, the SAC is considered approved. If the Director, DIT approves the SAC document within the 30 days, it is considered effective immediately. If the Director, DIT disapproves the SAC document, the SACC will make the appropriate changes and resubmit it to the Director, DIT, repeating the process until the Director, DIT approves the SAC document as indicated above.

1.4.2.3 Effective Date

The new SAC becomes effective on the date of approval by the Director, DIT. After approval, the new SAC will be announced and made available on the SACC WebBoard.

1.4.3 Conformance

Following the effective date of the new Programming SAC, newly submitted RPMS packages must adhere to the new SAC unless otherwise exempted as presented in this document.

1.4.4 Requests for Exemptions from Programming SAC

1.4.4.1 Procedure

If an individual identifies the need for an exemption from the SAC for a given package, a request must be made to the SACC either via written notification using the form in Appendix B or the SACC WebBoard. Exemption requests should be submitted as early as possible in the development cycle.

1.4.4.2 Requirements

Exemption requests should include the following information:

- Package name and version number
- Type (Permanent or temporary)
- Violated Standard
- Justification and comments

1.4.4.3 SACC Review

After reviewing the need and impact of the proposed exemption, the Chairperson of the SACC will call for a vote on the request. A simple majority decision by the SACC shall be required to recommend a SAC exemption to the Director, DIT.

1.4.4.4 Decision Notification

Notification of the decision of the Director, DIT will be made to the requestor and will be published on the WebBoard.

1.4.5 Publication of Current Programming SAC

In order to promote rapid dissemination, the current version of the IHS SAC will be published on the SACC WebBoard for all users to access. All developers should recognize the need for periodic review of the SACC WebBoard.

2.0 Programming Standards and Conventions

This version of the Programming Standards and Conventions (SAC) was adopted by IHS on January 14, 2003 and then revised between May and September 2005.

2.1 General Programming Standards and Conventions

The definitions, standards and conventions within this section apply to all programming and user environments for use in the RPMS. This includes all applications that use commercial software products as an integral part of the RPMS (but not to the commercial application itself) and to all development environments including, but not limited to programming languages such as M or Pascal and graphical user interface (GUI) environments such as Visual Basic, Delphi, etc.

2.1.1 Document Definitions

2.1.1.1 Application Programmer Interface (API)

See Published Entry Point (PEP)

2.1.1.2 Conventions

Programming guidelines that are designed to promote consistency and safety across RPMS applications. Exemptions from conventions are not required, but developers are strongly encouraged to follow them.

2.1.1.3 DBA

Database Administrator

2.1.1.4 DHCP

Decentralized Hospital Computer Program. Department of Veterans Affairs (VA) software equivalent to the RPMS, now called VistA.

2.1.1.5 Entry Point

A line label within a routine, other than the first line of the routine, that is referenced by a "DO" or "GOTO" command from another routine in the same package to which the routine belongs.

2.1.1.6 Exemption

Authority granted by the SACC to a specific RPMS/VistA application that allows that application to not comply with a particular section of the SAC for a specified timeframe.

2.1.1.7 Kernel

The Kernel is a set of VA software utilities that form the foundation of VistA/RPMS and include elements that start with the namespaces XG*, XLF*, XPD*, XQ*, XT*, XU*, XV*, ZI*, ZO*, ZT*, ZU*.

2.1.1.8 MailMan

MailMan is a set of VA software utilities that form the foundation of VistA/RPMS electronic mail and communications and include elements that start with the namespace XM*.

2.1.1.9 Namespace

A unique set of alpha characters assigned by the DBA, commonly used to uniquely identify package components.

2.1.1.10 Numberspace

A unique set of numbers assigned by the DBA, commonly used for assigning FileMan files.

2.1.1.11 Package

A set of routines, files, options, templates, security keys, screens, bulletins, functions, help frames, forms, blocks, objects, protocols, dialogues, list templates, windows, etc., namespaced according to DBA requirements that function as a unit.

2.1.1.12 Programmer Mail Group

The Programmer mail group (G. Programmer) is established on the IHS MailMan system for discussion of technical issues. This mail group is used to disseminate information to the IHS RPMS development community. (Subsequent changes to the SAC will indicate a migration from the use of MailMan to the use of WebBoard.)

2.1.1.13 Published Entry Point (PEP)

A line label in a routine, other than the first line of a routine, which has been internally documented as a published entry point, and documented in the technical manual as a published entry point, that is available to be referenced by a "DO" or "GOTO" command from a routine external to the package to which the routine belongs. (This is also known as an Application Programmer Interface (API).)

2.1.1.14 SACC WebBoard

A documentation and conversation facilitator based on Internet technology for issues related to the IHS Standards and Conventions, found at http://forum.ihs.gov/~sacc.

2.1.1.15 Standard

A rule that all RPMS/VistA software must follow.

2.1.1.16 Supported Reference

Routine labels, extrinsic functions, files or global nodes that are accepted and documented by the DBIC and listed on the DBA menu on IHS Mail.

2.1.1.17 User

A person interacting with computer applications.

2.1.1.18 Utility

A callable routine line tag or function. A universal routine like XB*, ZIB*, AUPN*, usable by anyone.

2.1.1.19 Up-hat

"^" which is denoted on the keyboard by pressing Shift+6, a circumflex, also known as "hat" or "caret". It is used as a piece delimiter in a global.

2.1.1.20 VA FileMan

The Database Management System for RPMS/VistA, with namespaces DD*, DI*, and DM*.

2.1.1.21 VistA

Department of Veterans Affairs (VA) software equivalent to the RPMS. VistA stands for **V**eterans Health **I**nformation **S**ystems and **T**echnology **A**rchitecture.

2.1.2 Files

2.1.2.1 Naming Requirements for Files Used by RPMS/VistA Packages

2.1.2.1.1 VA FileMan

All VA FileMan files in the M Language environment must be numberspaced and namespaced in the spaces assigned to the package by the DBA. See Appendix A.

2.1.2.1.2 DOS, VMS, UNIX or Other Host Files

All DOS, VMS, UNIX or other host files created or exported as part of a RPMS/VistA application must be namespaced in the namespace assigned by the DBA. See Appendix C.

2.1.2.2 Exporting Script Files

Packages exporting script files should provide script files for a variety of the terminal emulation packages commonly in use in the VA/IHS.

2.1.2.3 Exporting Spreadsheets

Packages exporting spreadsheet templates should apply protection to embedded formulas to prevent accidental deletion by a user. Spreadsheet templates should contain documentation describing the purpose of the template, complex functions, and user help.

2.2 M Language Programming Standards and Conventions

All M-based RPMS/VistA software will meet the following standards and comply with the spirit of the conventions.

2.2.1 ANSI Standards

The 1995 ANSI/MDC X11.1 Sections 1 and 2 will be adhered to unless explicitly modified by this document.

2.2.1.1 Standard Dictionary Releases

All development will be produced using the most recent standard dictionary releases as distributed by the OIT.

2.2.1.2 Fields Within A String

Fields within a string will be separated by the "up-hat" symbol except when the data within the string must contain the "up-hat" itself.

2.2.1.3 Reindexing of File Manager MUMPS Cross-References

Reindexing of individual File Manager MUMPS cross-references must not result in an error. This affects both "set" and "kill" logic.

e.g., Use I $D(XYZ),XYZ'="" S ^GBL("AC",XYZ)=""

2.2.1.4 FileMan Entry Points

Only standard documented FileMan entry points will be called by IHS routines.

2.2.1.5 Restrictions When Creating a Package For Distribution

All packages submitted for certification for release to I/T/Us will be in a KIDS build, will contain only those components that belong to the package, and will not contain global data except as allowed by KIDS. Components that are part of one package will not normally be distributed with another package. Exceptions are existing authorized applications that are related but require separate KIDS builds, which can be placed in a composite transport.

2.2.1.6 File Manager File Access Code Security

All packages delivered to the SQA for verification and distribution will come with complete File Manager file access code security in the data dictionary. All files will have programmer only data dictionary access. This assures that security will be present initially if dictionaries are deleted prior to installation. The only exception to having file access security codes is in the READ field in a DD in which case it can be without access or blank. If developers need file access codes for their packages, they will coordinate this with the DBA.

2.2.1.7 Version Information

Complete version information will be set into the package file (DIC(9.4)) and all files for a package will have the version number in DD(file#,"VR"). The version number

incorporated into any patch name must be exactly the same as the application's version number. No extra trailing zeros will be allowed.

2.2.1.8 LAYGO Restriction

Application programs will not allow LAYGO entry to the New Person file. Packages which need to be able to add to this file will have separate locked options that come with the package, but that are not assigned to any of the package menus as distributed. Application programs will not allow "LAYGO" to standard tables.

2.2.1.9 Entry in File 9000010

Packages external to PCC that are passing data to the Visit and V-files must use the current visit creation API to select or create a visit entry in file 9000010. The APCDALVR will be used to append a V-file entry to a visit file entry. Documentation on this API can be found in the Developers' Handbook document.

2.2.1.10 Use of Sensitive Patient Tracking with Patient Lookup

If an application does not use the standard FileMan lookup for patient selection, then the API to check for Sensitive Patient Tracking status must be called and business rules followed. Documentation on this API can be found in the Developers' Handbook document.

2.2.2 Routines (Routine Structure and Format)

2.2.2.1 First Line

The first line of a routine will have the following:

(routine name) ; (Agency)/(site)/(programmer)-(brief description) ; (date of edit)

e.g., AGPAT ;IHS/OKC/LD - Patient registration driver; JUL 20, 1986

2.2.2.1.1 First Line

The first line of a routine cannot contain the formal list for parameter passing.

2.2.2.1.2 Generated Routines

Routines generated by VA FileMan or Kernel (e.g., INITs, ONITs, NTEG, and compiled routines) and other compiled routines used in exporting a package, need not comply with this standard.

2.2.2.1.3 Agency/Site/Programmer

This shall identify the developing Agency and site, and the programmer (author) of the routine.

2.2.2.1.4 Date of Edit

The use of time in date of edit is optional.

2.2.2.2 Second Line

The second line of a routine must be in the following format:

LABEL-optional<ls>;;version number;package name;**pm,...pn**;version date

Where:

2.2.2.2.1 Version Number

The version number must be the same on all of the package-namespaced routines including the Inits, Onits, etc.

2.2.2.2.2 Patch Numbers

"pm,...pn" are the applied patch numbers separated by commas, this ";" piece is null if there are no patches.

2.2.2.2.3 Version Date

The version date must be the same on all of the package namespaced routines including the Inits, Onits, etc.

2.2.2.2.4 Compiled routines

Routines compiled from templates, cross-referenced, etc., by VA FileMan during or after package installation are exempt from the second line requirement.

2.2.2.2.5 Local Modifications

If local modifications to a routine are restricted or prohibited by policy or directive, the third line should contain an appropriate notice. (e.g., "Per VHA Directive 10-92-142, this routine should not be modified")

2.2.2.2.6 Labels

Labels are limited to eight (8) characters and may not contain lower case characters.

2.2.2.2.7 Label+Offset

Label+offset references will not be used except for $TEXT references.

2.2.2.2.8 Lines Referenced by $TEXT

Lines referenced by $TEXT for use other than to check for the existence of the routine must be in the following format: (LABEL-optional)<ls>;;text or M code.

2.2.2.3 Linebody

The linebody must contain at least 1 character, must not exceed 245 characters in length, and must contain only the ASCII characters values 32-126. Commands, functions, local and global variable names, system variables, SSVNs, etc., must be uppercase.

2.2.2.4 Routine Names

Package routine names of the following forms will not be used:

- **NAMESPACE_I*** (with the exceptions of Kernel, VA FileMan, and routines created to support the INIT process)
- **NAMESPACE_NTE*** (with the exception of the package integrity routines)

2.2.2.5 Routine Size

The maximum routine size, as determined by executing ^%ZOSF("SIZE"), is 15,000 characters. The combination of routine and symbol table must run in the partition size specified in the appropriate VA/RPMS operating system manual/cookbook.

2.2.2.6 Vendor Specific Subroutines

Vendor specific subroutines may not be called directly except by Kernel, MailMan and VA FileMan.

2.2.2.7 TaskMan Globals

All applications will use documented TaskMan utilities to interface with TaskMan globals.

2.2.2.8 Naked References

Naked references must either be appropriately preceded by the full reference defining it or be documented.

2.2.2.8.1 Full Reference

An appropriate preceding full reference is one that is on the same physical routine line as the naked reference and has no code between it and the naked reference that branches in any manner to other lines of code or executables.

2.2.2.8.2 Documenting

Those naked references requiring documentation must be documented within the routine in the immediate vicinity of the naked reference. Those naked references that are preceded by a full reference that is outside of the routine where the naked reference is used must have documentation in both the routine containing the full reference and the routine containing the naked reference. This documentation must be in the immediate vicinity of the appropriate reference.

2.2.2.8.3 In Called Utilities

Uses of naked references in called utilities are exempt, e.g.,

```
S DIC=200,DIC(0)="AEQ",DIC("S")="I $L($P($G(^(1)),"^",9))" D ^DIC
```

is a legitimate use of the naked reference.

2.2.2.9 % Routines

2.2.2.9.1 % Routines

No application will distribute % routines. (Exemptions: Kernel and VA FileMan)**.** No % routines shall execute variables that could be set by a programmer prior to executing the code.

2.2.2.9.2 View Commands

No routine that will be resident in the Library (MGR) account will use VIEW commands using variables as arguments that could be set by a programmer prior to executing the code.

2.2.2.10 Z Routines

2.2.2.10.1 Z Routines

No application will export routines whose names start with the letter "Z". (Exemption: Kernel)

2.2.2.10.2 Creation of Local Routines

When creating local routines to be added to an existing national package, the routine name will begin with the namespace followed by the letter "Z".

2.2.2.11 Extended Reference Syntax

Routines may not be invoked using the extended reference syntax, i.e., D ^|"VAH"|TAG^ROUTINE is illegal.

2.2.2.12 Entry Points

Lines that are entry points (referenced by a DO or GOTO in other routines) will consist only of a label and a semi-colon followed by "entry point" or the abbreviation of "EP". An optional comment that describes the entry point may follow the entry point comment.

e.g., CLEAR ; EP - CLEARS SCREEN

e.g., CLEAR ; ENTRY POINT - CLEARS SCREEN

2.2.2.13 Published Entry Points

Lines in a routine, other than the first line, that are published entry points (PEP) must consist of a label (and, optionally, the formal parameter list) and a semicolon followed by “Published Entry Point” or the abbreviation “PEP” followed by a comment.

2.2.2.14 Changed Lines

Lines changed from the standard release will be marked with a semicolon and comment. This comment will contain the Agency and site identification, the programmer's initials, the date of the change, and reason for the change. Duplicate and comment out the original line of code. Additional comment lines may be used.

```
e.g.,  CHGLINE;
 ;S ZXXX=3
    S AXXX=3 ; IHS/ABQD/FBD 04/01/96
```

```
;This was changed to conform to IHS SAC.
```

2.2.2.15 IHS Changes to VA Packages

IHS changes to VA packages will be incorporated into separate routines or templates using a proper IHS namespace, rather than embedding the changes in the middle of VA programs. (A "DO" statement will be used to exit to the IHS routines, if needed). When it is not possible to use an external IHS routine when modifying VA packages,add changes in the format outlined in Standard 2.2.2.14.

2.2.2.16 Comments

Comments will be provided at the start of each independently callable routine specifying the items listed in paragraphs 2.2.2.16.1 through 2.2.2.16.3.

2.2.2.16.1 Purpose or Function

Overall functions or purpose of routine.

2.2.2.16.2 Input Variables

Input variables (variables set up by other routines that are used by this routine).

2.2.2.16.3 Output Variables

Output variables (variables set by this routine).

2.2.2.17 XB/ZIB Prefixed Routines

AU/AZ prefixed utility routines have been re-namespaced XB/ZIB respectively. All XB prefixed utility routines will refer to utility routines that are totally universal from machine to machine regardless of operating system or hardware. All ZIB prefixed utility routines will refer to utility programs that are operating system or hardware dependent. All program calls to previous AU/AZ prefixed utility routines must be changed to make the program calls to the XB/ZIB equivalent utility routines.

2.2.2.18 Facility or Area Specific Information

Facility or Area specific information needed by a routine will be obtained from tables or input parameters, rather than being hard-coded in the routine.

2.2.2.19 Approved Exemptions

Approved exemptions to standards must be documented in the routine with a separate comment line adjacent to the line containing the exemption in the form:

;IHS exemption approved on DATE

2.2.2.20 "Namespace" Var Routine

Packages that need to set local variables prior to entering a package will use a routine that is named in the form 'namespace' VAR.

2.2.2.21 Data Conversion Processes

All data conversion processes should be restartable at the point of interruption in the execution.

2.2.2.22 Syntactically Correct Lines

All lines must be syntactically correct. Blanks will not appear at the end of lines.

2.2.2.23 Routine Source Code

All RPMS applications must submit all source code for technical verification.

2.2.3 Variables

2.2.3.1 Local Variables

2.2.3.1.1 Case

Lowercase characters in local variable names are prohibited.

2.2.3.1.2 Length of Local Variables

The full evaluated length of a local variable name including subscripts must not exceed 200 characters. The evaluated length is calculated as follows

Example subscripted variable:
NAME(sub1,sub2,...,subn)
(1.) +$L(NAME)+3
(2.) +$L(sub1) + $L(sub2) + ... +$L(subn)
(3.) + 2 * number of subscripts n
(4.) +15

VAR("XXX",123,1,2,0) would evaluate to a string length of 42 (6+11+10+15)=42.

2.2.3.1.3 System-Wide Variables

Variables

The following are system wide variables. Any application setting system-wide variables must conform to the following definitions.

- **AGE** - Patient age in years from date of birth to DT expressed as an integer, or, if deceased, the date of death
- **DFN** - Internal number of an entry in the Patient File (#2)
- **DOB** - Patient date of birth expressed in internal VA FileMan format
- **SEX** - Patient sex; either "F" or "M"
- **SSN** - Social security number with 9 contiguous digits, or 9 digits and a "P"
- **VA ("BID")** - Brief patient identifier; up to 7 characters
- **VA ("PID")** - Patient identifier; up to 15 characters

Assumed Variables

The DT*, DUZ*, IO*, and U variables, referenced elsewhere in this document, are set by Kernel during sign-on, or by VA FileMan, and can be assumed to exist by all VistA/RPMS applications. Refer to the Kernel Systems Manual or the VA FileMan Technical Manual for their definitions.

2.2.3.1.4 DUZ or DUZ-Array

RPMS/VistA packages are not allowed to KILL, NEW, SET, MERGE, READ (into) or otherwise modify the variable DUZ or any DUZ-array element with the exception of DUZ(2) (Exemptions: Kernel and VA FileMan). In order to allow programs to run stand alone or for transport to non-Kernel environments, DUZ and its descendants can be set after confirming that they do not already exist.

2.2.3.1.5 DUZ(2)

The VA local variable DUZ(2) will be set for all users upon logon by Kernel, using the FACILITY field in the New Person. A user will be able to log on to only those sites listed under the FACILITY field in his or her New Person file entry. Any application allowing a user to switch facilities in a package will use this multiple field in the New Person file when selecting a valid site for the user to switch to. If a package modifies DUZ(2) after the original set, it will be reset to its original value before exiting the package. A value of 0 in DUZ(2) or the existence of the local variable AUPNLK("ALL") will allow complete lookup ability for all facilities in the Patient File.

2.2.3.1.6 Special Variables

The variables DT, DTIME, and U have no array elements and shall be initially defined by Kernel or VA FileMan.

Variable U

The variable U will not be KILLed or NEWed or changed from the value defined by Kernel or VA FileMan. (It is legal to SET U="^".)

Variable DT

The variable DT will not be KILLed or NEWed. If changed it must be set using the supported reference S DT=$$DT^XLFDT.

Variable DTIME

The variable DTIME may only be changed to a value less than the existing value of DTIME, but must be restored to its original value before exiting the option. All routines where DTIME is changed but not restored prior to exiting the routine must be documented in the Technical Manual, including the location where DTIME is restored.

2.2.3.1.7 IO Variables

RPMS/VistA packages are not allowed to KILL, SET, MERGE, READ (into) or otherwise modify IO namespaced variables and any of their array elements except those documented as modifiable in the Kernel System Manual. (Exemption: Kernel, MailMan, and VA FileMan) The routine XBKVAR can be invoked to set these variables.

2.2.3.1.8 % Variables

RPMS/VistA packages are not allowed to KILL, SET, MERGE, READ (into) or otherwise modify % variables. Exceptions to this are the single character variable "%" and the variables set for and/or returned by Kernel and VA FileMan supported references. (Exemption: Kernel, VA FileMan, and MailMan)

2.2.3.1.9 Scope of Namespaced Variables

A RPMS/VistA package may declare namespaced, local variables as package-wide. The variables and all of their array elements must be described in the package Technical Manual. A RPMS/VistA package may not kill or change another RPMS/VistA package's package-wide variables.

2.2.3.1.10 Documentation

Documentation on how to create and kill package-wide variables created by an option that is removed from its exported menu path must be included in the Technical Manual.

2.2.3.1.11 Lock Tables/Local Symbol Tables

All supported references must leave the lock tables and local symbol tables unchanged upon exit with the exception of the following:

- Documented input and output variables (including globals)
- Supported reference namespaced variables may be changed or killed (for example, the VA FileMan ^DIC call kills the variable DIE, which may exist in the symbol table prior to the call)
- Documented side effects, such as lock table changes, and changes to files
- The variable %

These supported references must be documented in the package Technical Manual with a descriptive list of ALL input and resulting output variables.

2.2.3.1.12 Variables Passed Between Packages

Naming requirements for variables passed between packages.

Actual List

Input variables in an Actual List passed by reference between packages must be package namespaced.

Legal:

```
D BLD^DIALOG(3500010,"",.IBDATA,"IBX")
```

Illegal: D BLD^DIALOG(3500010, "",.Y,"IBX")

Input Variables

Input variables that represent local variables into which data will be exchanged must represent a data location that is package namespaced.

Legal:

```
S DA=10,DR=".01;.104",
    DIC="^DPT(",DIQ="IBX" D EN^DIQ1
```

Illegal:

```
S DA=10,DR=".01;.104",
    DIC="^DPT(",  DIQ="Y"  D EN^DIQ1
```

2.2.3.2 Global Variables

2.2.3.2.1 Global Name

Lowercase characters in global names and global subscripts are prohibited. (Exemption: Cross-references created using field values containing lowercase characters and subscripts used in the ^TMP and ^XTMP globals.)

2.2.3.2.2 Length of Global Reference

The full evaluated length of a global reference must not exceed 511 characters. The evaluated length is calculated as follows.

Example subscripted variable:

^NAME(sub1,sub2,...,subn)

(1.) +$L(NAME)+3
(2.) +$L(sub1) + $L(sub2) + ... +$L(subn)
(3.) + 2 * number of subscripts n
(4.) +15
^TMP("XXX",123,1,2,0) would evaluate to a string length of 42 (6+11+10+15)=42.

2.2.3.2.3 Unsubscripted Globals

The KILLing of unsubscripted globals is prohibited. (VA FileMan's EN^DIU2 utility allows the deletion of files stored in unsubscripted globals, and therefore, allows the killing of unsubscripted globals. Application developers must document when calls to EN^DIU2 are made to delete files stored in unsubscripted globals.)

2.2.3.2.4 %Globals

READing, KILLing, SETting or MERGing ^% globals is prohibited. (Exemption: Kernel) %Globals will not be created without approval from the SET.

2.2.3.2.5 Globals

All globals must be VA FileMan compatible. ^TMP, ^XTMP and ^UTILITY have a standing exemption from this requirement.

^TMP Global

The global ^TMP will be used as a scratch global within a session. The first subscript shall be $J, or the first two subscripts shall be a package namespaced

subscript followed by $J. The ^UTILITY global will not be used unless necessary to retrieve output from a Kernel or FileMan Utility.

^XTMP Global

The global ^XTMP will be translated, with one copy for the entire RPMS production system at each site. The structure of each top node shall follow the format ^XTMP(namespaced- subscript,0)=purge date^create date^optional descriptive information, and both dates will be in VA FileMan internal date format.

2.2.3.2.6 Executable Code

Fields in VA FileMan files that contain executable code must be write protected in the DD with "@" (e.g., ^DD(file,field,9)="@"), or be defined as VA FileMan data type of "MUMPS".

2.2.3.2.7 DD Global

Sets and Kills to the DD Global are prohibited.

2.2.3.2.8 Global Variables

All global variables executed by % routines must be in write protected globals.

2.2.3.2.9 Global Names

Extended reference syntax may not be used to reference global variables, i.e.,

S X=^|"VAH"|GLOBAL(1,1) is illegal.

2.2.3.3 Intrinsic (System) Variables

2.2.3.3.1 Intrinsic Variables

Lowercase intrinsic variables are prohibited.

2.2.3.3.2 Intrinsic Variables

No VistA/RPMS package may use the following intrinsic (system) variables unless they are accessed using Kernel or VA FileMan supported references: $D[EVICE], $EC[ODE], $ES[TACK], $ET[RAP], $I[O], $K[EY], $P[RINCIPAL], $Q[UIT], $ST[ACK], $SY[STEM], $Z*. (Exemption: Kernel and VA FileMan)

2.2.3.4 Structured System Variables (SSVNS)

2.2.3.4.1 SSVNS

Lowercase SSVNs are prohibited.

2.2.3.4.2 Restricted SSVNS

The following structured system variables may be used only by Kernel or VA FileMan or through their supported references: ^$CHARACTER, ^$DEVICE, ^$DISPLAY, ^$EVENT, ^$GLOBAL, ^$JOB, ^$LOCK, ^$ROUTINE, ^$SYSTEM, ^$Z*, and ^$WINDOW.

2.2.4 Commands

2.2.4.1 Case

Lowercase commands are prohibited.

2.2.4.2 BREAK Command

Direct use of the BREAK command is prohibited. Use ^%ZOSF("BRK") and ^%ZOSF("NBRK"). (Exemptions: Kernel and VA FileMan)

2.2.4.3 CLOSE Command

Direct use of the CLOSE command is prohibited. Use the routine ^%ZISC. (Exemptions: Kernel, MailMan and VA FileMan)

2.2.4.4 HALT Command

Direct use of the HALT command is prohibited. Use the supported reference H^XUS. (Exemption: Kernel and VA FileMan)

2.2.4.5 JOB Command

Direct use of the JOB command is prohibited. Use the Kernel Task Manager's supported calls to create jobs. (Exemption: Kernel and MailMan)

2.2.4.6 KILL Command

2.2.4.6.1 Argumentless

The argumentless form of the KILL command is prohibited. (Exemption: Kernel)

2.2.4.6.2 Exclusive

The exclusive form of the KILL command is prohibited. (Exemptions: Kernel and VA FileMan)

2.2.4.7 LOCK Command

2.2.4.7.1 LOCK

All LOCKs shall be of the incremental or decremental form. All routines will lock nodes to be created or updated. Appropriate error recovery action will be taken if the lock is not obtained. (Exemption: Kernel)

2.2.4.7.2 Incremental LOCK

All incremental LOCKS must have a timeout.

2.2.4.8 NEW Command

2.2.4.8.1 Argumentless NEW

The argumentless form of the NEW command is prohibited.

2.2.4.8.2 Exclusive NEW

The exclusive form of the NEW command is prohibited. (VA Only)

2.2.4.9 OPEN Command

The use of the OPEN command is prohibited. (Exemptions: Kernel, MailMan and VA FileMan)

2.2.4.10 READ Command

2.2.4.10.1 READ

All READ commands shall read into local variables, or one of the non-VA FileMan compatible globals, ^TMP and ^XTMP.

2.2.4.10.2 READ

All user input READs must have a timeout. If the duration of the timeout is not specified by the variable DTIME and the duration exceeds 300 seconds, documentation in the package Technical Manual is required.

2.2.4.10.3 READ

All user input READ commands shall be terminated by a carriage return. (Exemption: Kernel and VA FileMan) (Developers desiring to implement escape processing [function keys, arrow keys, etc.] must use Kernel supplied supported references [XGF]).

2.2.4.10.4 READ

Use of the READ command in a data dictionary is prohibited.

2.2.4.11 USE Command

The use of the USE command with parameters is prohibited. (Exemptions: Kernel and VA FileMan)

2.2.4.12 VIEW Command

The use of the VIEW command is prohibited. (Exemptions: Kernel and VA FileMan)

2.2.4.13 MWAPI Commands

No RPMS/VistA package may use the MWAPI Commands, ESTART, ESTOP, and ETRIGGER. (Exemption: Kernel)

2.2.4.14 WRITE

Use of the WRITE command in a data dictionary is prohibited. The call to EN^DDIOL will be used (Exemption: VA FileMan).

2.2.5 Z* Commands

The use of Z* commands is prohibited. (Exemptions: Kernel and VA FileMan)

2.2.6 Functions

2.2.6.1 Case

Lowercase functions are prohibited

2.2.6.2 Intrinsic Functions

2.2.6.2.1 $NEXT

Use of the $NEXT function is prohibited. All RPMS packages should remove all occurrences of $NEXT. This includes occurrences generated by VA FileMan.

2.2.6.2.2 $VIEW

The use of the $VIEW function is prohibited. (Exemptions: Kernel and VA FileMan)

*2.2.6.2.3 $Z**

The use of $Z* functions are prohibited. (Exemptions: Kernel and VA FileMan)

2.2.6.2.4 $ORDER

Reverse $ORDER through the local symbol table when the variables are un-subscripted is not supported by Cache' and is prohibited. Reverse $ORDER through subscripted local variables is supported and allowed.

2.2.6.3 Extrinsic Functions

2.2.6.3.1 Parameters

Supported References that use parameters will document the elements of the formal list internally within the routine and in the package Technical Manual. Documentation will specify which elements of the formal list are required and which are optional, if any, and those elements that must be passed by reference.

2.2.6.3.2 Supported Extrinsic Special Variables

Extrinsic functions with an empty formal list will be documented within the routine and in the Technical Manual.

2.2.7 Name Requirements

2.2.7.1 Package Namespace

Unless approved by the DBA, routine, global, security key, option, template, bulletin, function, screen, help frame, protocol, form, block, list templates, objects, dialogues, remote procedures, etc., names must be consistent with the assigned DBA namespace for the package. The namespace of all IHS-developed packages assigned after January 1, 1994 must begin with *B.*

2.2.7.2 "Namespace"Menu

All IHS packages with menu options will have a top menu option in the form of "namespace"MENU with a lock on that menu option that is of the form 'namespace'ZMENU. When entering this menu the current version of the package will be displayed above the options along with the location determined by the current DUZ(2) setting.

2.2.8 Options (Option file entries)

2.2.8.1 Selection

Option selection must be made through Menu Manager or using VA FileMan's DIR utility. DIR utility may only be used at the lowest menu tree level. Hardcoded menu management systems are not allowed.

2.2.8.2 Path Independence

All options in a package must be path independent once the steps described in the Technical Manual for creating and killing package wide variables have been taken.

2.2.8.3 After Exit

The following must not exist after exiting an option:

2.2.8.3.1 Output Variables

All documented output variables created by a called supported reference.

2.2.8.3.2 Locks

All documented locks created by a called supported reference.

2.2.8.3.3 Global Nodes

All documented temporary scratch global nodes (e.g., ^TMP and ^UTILITY) created by a called supported reference, with the exception of ^XTMP global data.

2.2.8.3.4 Variables/Locks/Globals

All local variables, locks, and scratch global nodes (except ^XTMP, or other scratch globals designed to be passed between parts of a package) created by the application.

2.2.8.4 Menu Options

All menu options in a package will utilize alpha synonyms, not numeric. This is to allow use of the Kernel menu jumping capability.

2.2.9 Device Handling

2.2.9.1 Device Handling

All device selection and closing will be made through the use of the Kernel supported references. See Sections 6.3 and 6.9 for specific information about the OPEN and CLOSE Commands.

2.2.9.2 Output Queuing

All output to a hard copy device (e.g., printer) must allow for queuing or use of an auxport printer. Internal device selection must be by device name rather than by $I. Developers should bear in mind that either IO or $I variables may be non-numeric. Forced queuing, which is sometimes desirable, will be local site parameter driven.

2.2.9.3 Outputs

Any output directed to a hard copy device (e.g., printer) will not start with a form feed or line feeds with the purpose of creating a form feed, and will leave the device at top-of-form when the output is finished.

2.2.10 Date Processing

2.2.10.1 Manipulation

Any date processing will accommodate the century.

2.2.10.2 Date Display

Date display will include the century where there is a potential for ambiguity.

2.2.11 Type A Extensions

No Type A extensions to the M Language standard are currently approved for use.

2.2.12 Miscellaneous Standards

2.2.12.1 Implementation Specific Functions

Application software must use documented Kernel-supported references to perform all M operating system specific functions. (Exemptions: Kernel and VA FileMan) In addition, %ZISH is to be used for Host File functions.

2.2.12.1.1 VA FileMan

Application software must use documented VA FileMan standards such as defaults, editing text, date/time format, spacebar recall, help prompts, deleting stored values, control of logic flow, escapes, etc. (See VA FileMan Users Guide). Developers are encouraged to use documented FileMan calls to the fullest extent possible. (See VA FileMan Programmers Guide.)

2.2.12.2 Data Element Interpreted as Number

Any data element that may be interpreted as a number must contain no more than 15 significant digits.

2.2.12.3 Published Entry Points (PEP or API)

2.2.12.3.1 SET or KILL

A SET or KILL to another application's data must be done through an API supplied by that application. All other retrieval of information should be done through an API or standard FileMan calls.

2.2.12.3.2 IO

If the published entry point has IO, the PEP will have a parameter to allow silent (background) processing.

2.2.12.3.3 Phase Out

Packages may phase out supported references (as callable from outside the application and documented in the technical manual) by providing a minimum 18-month notice to the PROGRAMMER and ISC mail groups on IHS Mail.

2.2.12.3.4 Utilization

No application will make a call to another application except through documented published entry points or supported FileMan/Kernel calls.

2.2.12.4 Character Set

All globals and routines will use only the M character set profile.

2.2.12.5 Assignment of Port Number for Interfaces

Any RPMS application that requires the use of a port number for interfaces will request said number from the DBA.

2.2.13 Conventions

2.2.13.1 ^UTILITY

Only Kernel and VA FileMan and existing Supported References should use ^UTILITY.

2.2.13.2 Deleting Tasks

Tasks should be deleted from Task Manager's list by setting the variable ZTREQ equal to "@" just prior to the application QUITing.

2.2.13.3 Routine Documentation

2.2.13.3.1 Entry Points

Routine line tags referenced from outside the routine should be documented before, on or after the line tag. Documentation should include a description of function.

2.2.13.3.2 Supported References/Routines

All supported references or routines invoked initially from an option or protocol should contain documentation explaining the functionality and any required, passed input and output variables.

2.2.13.4 Device a CRT

The proper method of determining if a device is a CRT is to check that the variable IOST starts with the string "C-". (e.g., I $E(IOST,1,2)="C-")

2.2.13.5 ^XTMP

Developers are encouraged to include other descriptive information on the third piece of the 0 node of the XTMP global, such as task description and creator DUZ.

2.2.13.6 Location Name

All packages will display the location name determined by the current DUZ(2) setting above all menus of the package.

2.2.13.7 Data Dictionary Field Numbering Conventions

Developers are encouraged to follow the field number conventions as documented in Appendix H: Data Dictionary Field Numbering And Data Placement Conventions and in the XB utilities.

2.3 Interface Programming Standards and Conventions

It is the intention of this section of the SAC to provide a consistent path for users as applications migrate from scrolling mode to a screen mode (either ScreenMan, List Manager, or screen-oriented editors) to a GUI environment.

2.3.1 User Interface Standards for Scroll Mode and Screen Mode

2.3.1.1 Deletion

Deletion of a data value, if permissible, must be initiated by the user entering the at-sign "@".

2.3.1.2 READ

Escapes from user-input READs, if permissible, must be initiated by the user entering a circumflex "^".

2.3.1.3 Help

All prompts requesting user input must provide additional help when the user enters a question mark ("?"). Any unrecognized or inappropriate response must be handled properly; i.e., at a minimum in a manner similar to the way VA FileMan handles responses (see VA FileMan User's Manual). Responses to READs that are in no way evaluated by the application are excluded from this requirement.

2.3.1.4 Defaults

In scrolling mode, defaults must be so indicated with a double slash ("//") or "replace" indicating that "replace/with" editing is allowed. The null response (i.e., typing only the RETURN key) shall select the default.

2.3.1.5 READ Timeouts

When a user input READ command times out, if the argument of the read is in any way evaluated by the application, the program must return to the Menu Manager with no more than one intervening read. A timeout at the menu level must halt through H^XUS.

2.3.2 User Interface Conventions For Scroll Mode And Screen Mode

2.3.2.1 Terminology

Developers are encouraged to use the following terminology.

2.3.2.1.1 EXIT

Exit ends a function or application and removes from the screen all windows and pop-ups associated with that function or application. If information has been changed, the application may automatically save the information, or prompt the user to save or discard the information.

2.3.2.1.2 QUIT

Like Exit, Quit ends a function or application and removes from the screen all windows and pop-ups associated with that function or application. If information has been changed, the application may automatically discard the information, or prompt the user to save or discard the information.

2.3.2.1.3 CANCEL

Cancel allows users to back out of a function or application, one pop-up at a time, until they reach the highest-level window. At that point, another Cancel request has the same effect as an Exit action.

When users Cancel a pop-up, the application can decide whether to discard or retain the information in that pop-up, depending on how the application wants to establish the default values the next time the pop-up is displayed. If the information is discarded and the pop-up is later re-displayed, the pop-up contains the default values set by the application. If the information is retained and the

pop-up is later re-displayed, the pop-up contains the same values as it did when the user canceled the pop-up.

2.3.2.1.4 CLOSE

Synonymous with Cancel.

2.3.2.2 Key Assignments

Developers are encouraged to use the following key assignments:

2.3.2.2.1 PF1 Key Gold

May result in different actions based on the next key selected.

2.3.2.2.2 PF2 Key Context-sensitive Help

Provides context-sensitive help about a specific item, field, or window.

2.3.2.2.3 PF3 Key Exit

2.3.2.2.4 Exit is defined in 2.3.2.1.1 above.PF4 Key Backtab

Moves the cursor to the previous entry field. The cursor moves from right to left, bottom to top.

2.3.2.2.5 F10 Key Menu Bar

Moves the cursor to the menu bar, if one is available, at the top of the window or pop-up currently in focus.

2.3.2.2.6 F12 Key Cancel

Cancel is defined in 2.3.2.1.3 above.

2.3.2.2.7 TAB Key Tab

Moves the cursor to the next entry field. The cursor moves from left-to-right, top-to bottom.

2.3.2.2.8 PF1,H Key Sequence

Application Help. Provides information about the particular segment of the application being used.

2.3.2.3 Lock

If a user is waiting for a lock that times out, then appropriate notification should be given to the user.

2.3.3 User Interface Conventions for GUI Mode

2.3.3.1 GUI Standards Document

VistA/RPMS packages should follow the guidelines for GUI applications set forward in the VistA/RPMS Standards document. See Appendix G.

2.4 Operating System Programs, Scripts and Files Standards

2.4.1 Purpose

To provide guidance in certifying and distribution Operating System Programs, Scripts and Files that support the RPMS MUMPS applications. Operating Systems will include UNIX, Windows NT and Windows 2000.

2.4.2 Standards

2.4.2.1 Namespacing

All Operating System Programs, Scripts and Files shall be namespaced with the assigned namespace (i.e., aibxxxx).

2.4.2.2 Directory

All applications-related Shell Programs and Files shall reside in a unique subdirectory under a variable, parameter-driven directory depending on the operating system and user input. The subdirectory will be named using the assigned namespace (e.g., /usr/aib or D:\usr\aib).

2.4.2.3 Version

The first line of all Operating System Programs, Scripts and Files shall contain the name of the Shell Program or File and the version number of the application. The version number shall be the same as the associated MUMPS application version number.

2.4.2.4 Install Shell Program

An install Program shall be included in all distributions. This Install Program shall perform the following:

2.4.2.4.1 OS Determination

Determine the Operating System type to insure that correct files are loaded during the installation

2.4.2.4.2 Obtain Variables

Obtain variables/parameters based on user input to drive the actual installation

2.4.2.4.3 Ownership

Ensure that the ownership of the Operating System Programs, Scripts and Files are properly set and that they are correct for the Operating System.

2.4.2.4.4 Group Membership

Ensure that the group membership of the Operating System Programs, Scripts and Files are properly set and that they are correct for the Operating System.

2.4.2.4.5 Modes

Ensure that the modes of the Operating System Programs, Scripts and Files are properly set.

2.4.2.4.6 Subdirectories

Ensure that all Operating System Programs, Scripts and Files reside in the proper subdirectories based on variable, parameter driven input.

2.4.2.5 Operating System Commands/Utility Files

The RPMS application packages submitted for certification should not include standard OS commands and utility files (e.g., sendto command).

2.4.2.6 Patches

All corrections of errors identified in the production release should be treated similar to corrections in the associated MUMPS application by using the IHS Patch System. Each patch should be documented in the Operating System Shell Program, script or File beginning with the second line.

2.4.2.7 Enhancements/Modifications

All future enhancements and modifications of the application should be coordinated with the person who is responsible for developing or maintaining those applications affected.

3.0 Appendix A: RPMS Namespace Assignments

3.1 Purpose

Systems developed for the RPMS are identified by a set of program and file names, and are assigned a range of file numbers with the computer. Standards must be followed in assigning these names and numbers to ensure that they are unique and do not overlap between systems. The purpose of this documentation is to define these standards.

3.1.1 Responsibility

3.1.1.1 Program/File Name Assignments

The DBA will maintain a master list of all RPMS name assignments, and will assign and/or approve of new names for new systems.

3.1.1.2 File Numbers

Blocks of file numbers have been allocated to RPMS core systems, the Division of Data Processing Services (DDPS), and to each Area, as indicated in Figure 2.

The DBA will be responsible for maintaining and assigning file numbers for RPMS applications; the Area ISCs will maintain and assign file numbers for local systems.

3.2 General Standards

The general standards to be followed in assigning names are as follows:

3.2.1 Naming Assignments

3.2.1.1 Namespace Position 1

The namespace of all IHS-developed packages assigned after May 5, 1993 must begin with B.

3.2.1.2 Position 2-3

The next two to three characters will be the system prefix, and will be used to identify the application system itself (i.e., CHS for Contract Health Services, or CA for Cost Accounting).

3.2.1.3 Remaining Positions

The remaining characters will be used to identify names used within the application.

3.2.2 Other Standards

3.2.2.1 All Names

The use of "Z" as the fourth or fifth character, immediately after the system prefix, to designate locks, to distinguish locks from menus and options.

3.2.2.2 XB/ZIB - Utilities

XB/ZIB will be assigned to utilities that have applicability for multiple systems.

Initially, there will be no central assignment of XB/ZIB names. A developer will only need to select a name not already being used. If this should become a problem later, the DBA will coordinate assignments of XB/ZIB names. Routines that only apply to a particular application should carry the name prefix of that application.

3.2.2.3 BZ - Local Area Routines

BZ will be reserved for local program development, when there is no immediate plan or intention to distribute the system outside of the Area. ISC's should notify everyone within their Area who may be writing programs to use BZ as the first two characters of their application name. The ISC's should monitor and/or assign names with the BZ format to assure there is no duplication within the Area.

It is recommended that Areas use the third digit to identify the Area in which the system was developed. In this way, you can ultimately share the program with another Area with the assurance that it will not interfere with the local programs developed by the other Area. A list of Area codes to be used for this purpose is shown in Figure 1. BZ should be used when there is no intention to share the system outside of the Area. In all other cases, the ISC should contact the DBA for a global name assignment.

3.2.2.4 Universal Globals

The DBA will coordinate the name assignments of globals that have applicability for multiple systems. Globals that only apply to a particular application should carry the namespace of that application.

3.2.2.5 Standard Table Globals

The first two characters of the IHS Standard Tables will begin with AU. The third character will indicate the type of global as follows:

T = Table
P = Patient File
A = Administrative File

The fourth character will indicate whether the global supports UCI translation (i.e., can be accessible from multiple UCI's). These codes are:

T = Translation required
N = Not required

Thus a table, supporting UCI translation, would have as its first four characters:

AUTT _ _ _ _

Care should be taken not to misuse the AU name. Routines and globals that only apply to a particular system should carry the name prefix of that system.

3.2.2.6 Use of Prefix AVA

This prefix is reserved for IHS changes to VA files such as the New Person file. Its use should be coordinated through the DBA.

Codes for Area Use in Local Program Development	
A	Alaska
B	Billings
C	Aberdeen
D	Bemidji
H	OIT
L	California
N	Navajo
O	Oklahoma
P	Portland
Q	Albuquerque
S	Tucson
U	Nashville
X	Phoenix

Figure 1

RESERVED FILE NUMBERS

File Number Range	Reserved For
0-9999	VA VistA Supported Systems
90000-99999	IHS RPMS Systems (After 5/5/93)
8000000-8999999	SET, DSD, DTM, and DDPS
9000000-9999999	IHS RPMS Systems (Pre-1993)
1000000-1099999	Area 10, Site 00-99, File 000-999- Aberdeen
1100000-1199999	Area 11, Site 00-99, File 000-999- Alaska
1200000-1299999	Area 12, Site 00-99, File 000-999- Albuquerque
1300000-1399999	Area 13, Site 00-99, File 000-999- Bemidji
1400000-1499999	Area 14, Site 00-99, File 000-999- Billings
1500000-1599999	Area 15, Site 00-99, File 000-999- California
1600000-1699999	Area 16, Site 00-99, File 000-999- Nashville
1700000-1799999	Area 17, Site 00-99, File 000-999- Navajo
1800000-1899999	Area 18, Site 00-99, File 000-999- Oklahoma
1900000-1999999	Area 19, Site 00-99, File 000-999- Phoenix
2000000-2099999	Area 20, Site 00-99, File 000-999- Portland
2100000-2199999	Area 21, Site 00-99, File 000-999- Tucson

Figure 2

3.3 File Numbering Conventions

3.3.1 Reserved File Numbers

Blocks of file numbers have been reserved for each Area, the DDPS, and for RPMS core systems as shown in figure 2 above.

3.3.2 Multiple Files

When applications are developed that involve multiple files, the same integer may be used for all files directly related to the package, and decimal numbers used for members of the group. For example, a Personnel Package developed in Area 10, Site 05, might have the file number 1005007 and the group of files might be numbered as follows:

Personnel 1005007.1

Title 1005007.2

Wage Scale 1005007.3

3.3.3 Common Pointer Files

Common pointer files that are pointed to by various applications (e.g., LOCATION file) should be numbered in a different manner to indicate these files are not unique to a single application. For example, the common pointer files in the IHS RPMS Systems will be numbered 9999999.n where n is the next available sequential canonic number. If you have more than nine files in any single group you should append two digit numbers if you want them to sort out properly (e.g., 01, 02)--(.11 sorts lower than .2).

3.3.4 Area ISCs Files

The Area ISCs will assign file number ranges to their various sites, keeping in mind that there may be more than one system at a site. A range of numbers should also be retained for the Area office. The allocation of numbers will vary from Area to Area, depending on circumstances. Not that one may typically want to assign different site numbers to FileMan globals in PRD and PVT UCI's.

3.3.5 Locally Developed Application

When a locally developed application is to be incorporated into the IHS Core System, the files will be renumbered with the range 9000000 - 9999999. If one site wants to incorporate another site's application, the receiving site may want to renumber the files, or it may choose to run the application with the original site's file numbers. When each site conforms to these conventions, the transfer of applications from site to site should not be difficult.

3.3.6 File Manager File Numbers

File numbers in File Manager must be canonic; i.e., must not have leading zeros or trailing zeros following a decimal. This includes sub-files generated by multi-valued fields.

4.0 Appendix B: Request for Exemption to RPMS Programming Standards

Request for Exemption to RPMS Programming Standards

Package: Date:

Program:

Line Number:

Applicable Standard:

Reason for Exemption:

Developer

SQA Review Date:

Recommend APPROVAL___ DISAPPROVAL___

Comments:

Verifier(s)

SET Action Date:

Request APPROVED___ DISAPPROVED___

Comments:

Director, DSD

5.0 Appendix C: UNIX/Windows File Naming Standards

5.1 Purpose

Applications developed for the RPMS are distributed in sets of files, the names of which must conform to the specifications of the host operating system. A defined operating system-independent file name format will simplify the activities of staff responsible for manipulation of these files (Area support staff, facility site managers, etc.) and provide a structured paradigm that can be used for automated manipulation of these files by future applications. This standard is being established for this purpose.

5.1.1 Distributed Applications

This standard applies only to files of distributed applications. It is not necessarily binding upon filenames for test and verification copies of an application, due to their inordinately long version numbers (See Appendix D - Version Numbering for RPMS Systems).

5.2 General Standards

The general standards to be followed in assigning names for all host operating system files are as follows. Patches are addressed separately.

5.2.1 Positions 1-4

Positions 1-4 are reserved for the namespace of the RPMS application. If the application namespace is less than four characters, the remainder of the character positions may be padded with underline (_) character(s).

5.2.2 Position 9

Position 9 is a period or decimal point (.).

5.2.3 Namespace Case

Namespace and alphabetic codes will be in lower case for Distribution filenames.

5.3 Standards for Distribution Files

The standards to be followed in assigning names for RPMS application distribution files are as follows.

5.3.1 Positions 5-6

Positions 5-6 are reserved for the major portion of the RPMS application's version number (the portion preceding the decimal point). If less than two digits, this value should be right-justified and padded with one or more number 0 digits.

5.3.2 Positions 7-8

Positions 7-8 are reserved for the minor portion of the RPMS application version number (the portion following the decimal point). Position 8 will always be a 0 except when annotating a .pdf file as outlined elsewhere.

5.3.3 Position 10

Position 10 is reserved for an alphabetic code indicating the type of distribution file. The codes to be used are as follows:

Code	Description
g	Distribution Globals
u	Unix Files. Archived Unix Files
k	A file containing a KIDS transport distribution
z	Zipped/ Windows-related file

Example: apch0190.k would denote production UCI KIDS distribution for Version 1.9 of the PCC Health Summary package.

5.3.4 Position 11

Position 11 is a flexible field. Possible values for this field are as follows.

Code	Description
m	Routines or globals to be installed in MGR UCI
s	Required if using "u" in position 10 to denote Unix scripts/files

Example: xu_0710.rm would denote VA Kernel Version 7.1 routines to be installed in the manager UCI

5.3.4.1 Multiple Files

A single-digit numeric value used to denote one of multiple files to be installed in a production UCI.

Example: ade_0520.gl would denote the first set of globals to be considered in an installation of Version 5.20 of the IHS Dental package

5.3.5 Position 12

Position 12 is an optional numeric field. Possible values are as follows:

5.3.5.1 Multiple MGR/Script Files

A single digit value used to denote one of multiple files to be installed in the manager UCI or multiple UNIX script files.

Example: xu_0710.gm2 would denote the second set of manager UCI globals to be considered in an installation of Version 7.1 of the VA Kernel

5.4 Standards for Patch Files

The standards to be followed in assigning names for RPMS application patch files are as follows.

5.4.1 Position 10

Position 10 is reserved for a numeric. The numeric is to be the "tens" position of a two digit patch number. If there is no ten digit, a zero is to pad this space.

Example: xu__0710.10k would denote routines file for patch number 10 of Kernel Version 7.1

Example: xu__0710.02k would denote routines file for patch number 2 of Kernel Version 7

5.4.2 Position 11

Position 11 is reserved for a numeric. The numeric is the "ones" position of a two digit patch number.

Example: xu__0710.01k would denote a routines file for patch number 1 of Kernel Version 7.1

5.4.3 Position 12

Position 12 is reserved for an alpha-character as follows.

Code	Description
b	Patch Globals
n	Patch Notes
k	File containing a KIDS transport

Example: bw__0200.01n Notes for patch 2 of Women's Health Version 2.0.

5.5 Standards for Host Operating Shell Programs

Shell programs shall be in the form as outlined above through position nine. Position 10-16 will contain "install".

Example: aib_0300.install

5.6 Standards for Documentation Files

The standards to be following in naming documentation files is as follows.

5.6.1 Position 8

Character position 8 in a documentation file will contain one of the following codes.

Code	Description
u	User Manual
t	Technical Manual
s	Security Manual
r	Readme File
i	Installation Guide
n	Release Notes
o	Other

5.6.2 Position 10-12

Character positions 10-12 will contain "pdf" to designate that the particular manual was prepared in "pdf" format.

Example: bw__020u.pdf - User Manual in PDF format for the Women's Health Version 2.0

Example: bw__020t.pdf - Technical Manual in PDF format for the Women's Health Version 2.0

5.6.2.1 Distributed Documentation File

All documentation files will be "zipped" prior to final distribution. The "zipped" file will contain those files as outlined above.

Example: bw__0200.zip will contain the User, Technical and Readme File for Women's Health Version 2.0

5.7 Standard for Final Distribution File

The final distribution file will be a compressed tar file named using the above general standards for Positions 1-4 and position 9. The file will contain all the files necessary for the application, i.e., routines, globals, notes, Readme, all documentation files and any other files specified.

Example: bw__0200.tar.gz contains:

bw__0200.k	KIDS transport file
bw__0200.g	Globals
bw__0200.zip	Archived files (Windows)
bw__0200.us	Archived Host Operating System Files
bw__0200.install	Host Operating System Installation Program Files

6.0 Appendix D: Version Numbering for RPMS Systems

6.1 Purpose

Applications developed for the RPMS go through three primary phases of evolution; testing (both alpha and beta), verification, and distribution. A single version of an application can go through multiple iterations of the first two steps before being distributed, with each iteration differing from the previous one. This standard establishes a standard format whereby multiple iterations of an application can be easily managed by developers, testers, and verifiers.

6.2 Definitions

6.2.1 Distribution Version

The version number assigned to the application when released for IHS-wide installation.

6.2.2 Target Version

The intended distribution version number assigned to the application while going through the testing and verification phases.

6.2.3 Iteration

A single set of files containing all routines, globals and notes necessary to install the application.

6.2.4 Sequence Number

The number identifying the current iteration of the application in either testing or verification phases. Testing sequence numbers and verification sequence numbers are not consecutive.

6.3 Format

6.3.1 Format of UNIX file name:

6.3.1.1 Testing

Versions of an application submitted for alpha or beta testing will be signified by an lowercase letter t immediately following the target version. Immediately following the lowercase letter t will be the sequence number of the test version. There is no distinction between alpha and beta test iterations.

Example: bw__0350.t3r would identify the third test iteration of version 3.5 routines file of Women's Health.

6.3.1.2 Distribution

Applications that have passed verification will assume the target version of the last verification iteration.

Example: If bw__0350.t3r passes verification, the application will be distributed as version 3.5 and will be annotated in the unix file as bw__0350.r.

6.3.2 Format of M Routines

6.3.2.1 Second Routine Line

The 2nd line of all package M routines will reflect the test iterations.

Example: ABCTest; IHS/ABDEV/MMM-Example M routine; 11/4/95;;1.0t3;Test;*0*;11/4/95

6.3.2.2 Package File

The Package File will reflect the test iterations in the current version field. When the package passes verification the Package File will be cleaned to only include the final distributed version number.

7.0 Appendix E: Standards for Submission of Data to NPIRS

7.1 Overview

Many applications being developed to run on facility computers will have a requirement to generate and transmit data into an IHS-wide reporting system maintained at the NPIRS, in Albuquerque, New Mexico. Examples are the PCC Data Entry System, Patient Registration, Dental Data System and the Admission, Discharge and Transfer (ADT) System.

For these systems, the data will flow from the facility to the Area, where data will be consolidated for all facilities for each system, and then forwarded periodically via IHS wide-area network for each system to the NPIRS. The NPIRS will not accept data directly from individual facilities.

Standards and procedures have been developed to facilitate this transfer, and are described in this document. IHS is converting from NPIRS to a National Data Warehouse and the most recent documentation for exporting to the NDW is on our web page at: www.ndw.ihs.gov.

7.2 Facility Procedure

7.2.1 Creation of Transaction Global

A programmer or analyst developing a system with IHS-wide reporting requirements will need to determine the criteria by which data will be selected from the facility data base for transmission to the Area/NPIRS.

7.2.1.1 Process Options

There are a number of ways this can be done, including the following:

- Selection based on the transaction encounter date,
- Selection based on the facility posting date,
- A special flag to indicate whether data has been transmitted,
- Creation of a special global identifying records that have been created or modified since the last transmittal.

However, the data is identified, a program will be required to extract the data from the data base concerned, and generate a global that can be written to the host operating system (or transmitted directly) to the Area.

7.2.1.2 Global Creation Standards

The standards to be used in creating this global are as follows:

7.2.1.2.1 Global Name

The name of the global will be the four-digit namespace assigned to the system, such as AAPC, ACHS, BCHR, etc., concatenated with the word "DATA". If the namespace has less than 4 digits assigned, characters should be added to fill out the four spaces. Examples of these names are:

- ^AGTXDATA - Patient Registration
- ^AAPCDATA - PCC Data Entry
- ^ADENDATA - Dental Data System

7.2.1.2.2 "0" Node

The global will have a "0" node, followed by a series of data records subscripted from "1" to "n" for that transmission. For example:

- ^AGTXDATA(0)=
- ^AGTXDATA(1)=
- ^AGTXDATA(2)=

7.2.1.2.3 Pieces 1-5 and 7

The format of the "0" node is illustrated in Figure 1. Pieces 1-5 and 7 are required. The pieces are as follows:

Facility code
This is the standard IHS 6 digit code identifying the facility.

Facility Name
Narrative name of the facility.

Date of Run

The date that the global was created in the format YYYMMDD, where YYY is the number of years since 1700; i.e. 1988 would be 288, MM is the month (01-12), DD is the day of the month.

Beginning Date.

This field is required, but the definition of the field is program specific. For many programs, data will be selected by a range of dates (i.e., posting dates), and this field will be the earliest date in the date range. If this date is not important or used by the program concerned for data extraction, the date can be the date of the run.

Ending date

See above. If not important to the data extraction, the date can be the date of the run.

Last Record Transmitted

This field is optional, and was intended for use in cases where data was extracted based on some type of sequential number.

Number of Records

This is a count of the total number of records contained in the global (not including the "0" node), and is required.

Cartridge Number

The number of the cartridge on which the global will be written. This is for facility audit purposes. Not required.

Date Transmitted

The date the data file was transmitted. This field is normally not used, since this date and the date of the run are usually the same.

7.2.1.2.4 Data Node Format

The format of data in each data node is as follows:

Globalname(n)=xxx^data string (fields separated by a "^")

where: n is the next sequential subscript for the transmission,

xxx is the transaction type, i.e., RG1, RG2, IR1, etc.,

data string is the actual data being transmitted. Each field is separated by the "^". A piece must exist for each field in the transaction, regardless of whether there is any data for that piece, and all pieces must be in the same sequence as the fixed length transaction required at NPIRS.

Care must be taken to assure that the total length of the data in the node will never exceed 511 characters in length. If this should ever happen, the data needs to be broken down into two record types (i.e., RG1 and RG2).

An example of a global created for a particular application might be as follows:

```
^AGTXDATA(0)=508201^CARL ALBERT
HOSPITAL^2860804^2860701^2860731^^^3^^^
^ATGXDATA(1)=RG1^508201^336^SMITH^JAMIE^H^01^0608908^..
^AGTXDATA(2)=RG2^TOAHTY^MARY^^^Y^223098761A^...
^AGTXDATA(3)=RG1^508201^947^BEGAY^JOHNATHON^L^01^02
14893^...
^AGTXDATA(4)=RG2^ADAMS^EVA^^^N^123456789A^...
```

The AIB Record Consolidation System at the Area will eventually receive the above data and process it for the central computer. If there are two record types, as in the above example, they will be combined into a single record at NPIRS, with the data from the second record (RG2) added onto the end of the data from the first (RG1).

7.2.2 Transmission of Global to Area

A general purpose utility routine XBGSAVE has been developed to read a global as described above, and copy it to a tape cartridge. This utility requires that the name of the global be placed in the variable XBGZL prior to execution, i.e.,

```
S XBGL="AGTXDATA:

D ^XBGSAVE
```

Other variables can be set to select various IO options. See XBGSAVE for details.

Execution of this routine can be initiated automatically by incorporating the above routine at the end of the program that creates the global, or can be designed as a separate option to be selected from the program's main menu.

For MSM Systems:

The XBGSAVE routine will create global save format to a UNIX text file.

When the copy operation has been completed, the original global needs to be deleted before additional data is extracted and posted from the facility database. If an

operator fails to do this, new data will be merged with the data already sent to the Area, and this will all be re-forwarded to NPIRS on the next transmission. This could cause problems, depending on the system concerned. A programmer might want to consider automatically killing the global after successfully copying to the host operating system.

The above process can be done at whatever frequency is agreed upon between the Area and the facility.

7.3 Area Procedure

When facility data files are received at the Area for a particular application, they are merged into a file containing similar data from other facilities with the utility routines "AIB".

The AIB consolidate routines will determine the name of the file to be updated from the name on the incoming file (i.e., AGTXDATA). If the file already exists on disk (i.e., AGTXBLOB), the AIB consolidation routines will merge the data from the incoming data file into the global file. If the file does not exist, it will create the file.

At periodic intervals, normally once or twice a month, the Area will create a transmission file for all information in the global files using the AIB routines. This will delete the global files on the Area disk, and the cycle will start over when the next data file is received from a facility.

These convert programs refer to a table that identifies the fixed length transaction to be created from the incoming data records. The pieces in the data string must be in the same sequence as the transaction to be created. The table identifies the column in which each field starts, and the length of the field. For instance:

```
;1;3;   RECORD TYPE      (Starts in col.1;3 characters long)
;4;6;   IHS FACILITY CODE   (Starts in col.4;6 characters long)
;10;2;  TYPE OF ACTIVITY
;12;5;  REFERRAL CODE
```

If an incoming field is longer than the field in the fixed length transaction, it will be truncated.

If more than one record type is contained in the incoming global, e.g., RG1 and RG2, the convert program will combine the two records into a single transaction by adding the data from record two (RG2) onto the end of record one (RG1).

The fixed length transactions will be written out to a transaction tape at NPIRS, or stored in a transaction file, and processed on the next update of the application concerned.

Any programmer/analyst designing a system with reporting requirements to NPIRS will need to notify the SET with as much lead time as possible to allow the convert program to be developed by SET staff.

Each Area will be required to transmit monthly data sets to NPIRS computer. Users can submit their data using the Area Data Consolidation System (AIB).

7.4 NPIRS Procedure

The process for updating the master database will revolve around a program called *incoming* that begins by identifying file types and processing order of files received, updating each subsystem in the master database, activating a report generator, and electronically informing the submitting area of the status of its data.

7.4.1 IHS Subsystems

The master database is comprised of several systems that include Patient Registration (GTX), Patient Eligibility (ELG), Health Record Add (GHA), Inpatient Care (APC), Outpatient Care (INP), Inpatient and Outpatient Contract Health Services (CHS), and Patient Merge (GDM). The systems are listed in the order in which they are processed.

7.4.1.1 Patient Registration (GTX)

This subsystem is the first to be processed since it adds patients' records that are updated by the rest of the systems listed. The master database is searched for an existing facility code and health record number. If an entry is found, the health record is scanned for the associated patient record link. If no link is found, this indicates that this record was inserted by the health record add (GHA) subsystem and needs to be updated with the rest of the patient's personal information. If an entry is not found, the patient and associated personal information is inserted.

7.4.1.2 Patient Eligibility (ELG)

This subsystem is the second to be processed due to the remaining subsystems requiring updated eligibility information. This system updates an existing patient's eligibility record or creates a new eligibility record, depending on whether a starting or ending data is included in the incoming record.

7.4.1.3 Health Record Add (ELG)

This subsystem is the third to be processed because the remaining subsystems update records according to facility code and health record number. This system inserts a

new record into the chart table with only a health record number and an associated facility code. A flag is set in the new chart record to signal the GTX subsystem to connect this health record with a person. If the associated patient record exists, the GTX system updates the patient record with GTX information and the flag is removed.

7.4.1.4 Ambulatory Patient Care (APC)

This subsystem, which inserts an outpatient record, is the fourth to be processed.

7.4.1.5 Inpatient Care (INP)

This subsystem, which inserts an inpatient record, is the fifth to be processed.

7.4.1.6 Contract Health Services (CHS)

This subsystem, which inserts a contract health services inpatient or outpatient record, is the sixth to be processed. The source of this information not only comes from the Areas but from Blue Cross/Blue Shield (BCBS).

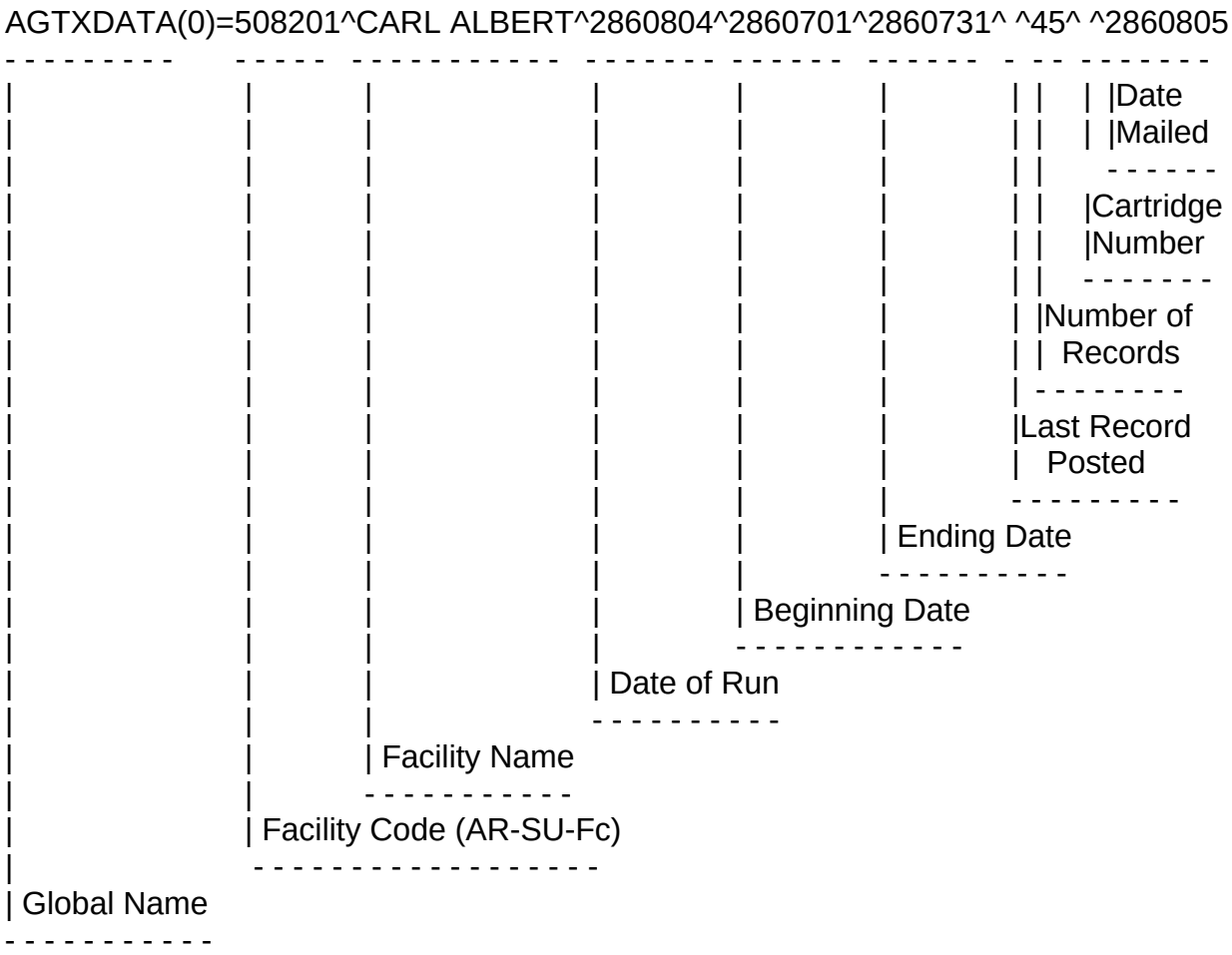
7.4.1.7 Patient Merge (GDM)

Formerly Delete/Merge, this subsystem is the last to be processed. This subsystem closes out old health record numbers by setting an ending date in the record, and creating a new health record using the updated information provided and populating the rest of the new record with the most recent information available.

7.4.2 Post Updating

To close out a month's processing, a table containing each Area's submission information is updated with the status of each system's results. If an Area has not submitted its data, the table will contain NULL values that will flag the operator and send a message to the Area contact and the appropriate NPIRS individual(s). A log file is also created for every file processed and resides in the same directory as the processed file that contains a full account of the processing and a summary of the essential totals. These totals are inserted into the Area's submit table that informs NPIRS that an Area has submitted its data. This process also allows for a previous month's count to be compared to the current month's count. If the current counts are within a preset percentage, an error is generated and sent to the Area contact and NPIRS individuals.

7.5 Formats of Globals Created at Facility



8.0 Appendix F: RPMS Documentation Standards

8.1 Purpose

The purpose of these documentation standards is to provide a basic documentation structure that can be applied to every software package, to provide consistency in all documentation, and to provide criteria by which documentation of a national package can be verified. To meet the Documentation Style Standards, all documents must follow and meet the style guidelines outlined here and in the OIT Documentation Style Guide (separate document).

8.2 General Standards

The general standards to be followed in preparation of all RPMS documentation are as follows.

8.2.1 Definitions

8.2.1.1 RPMS Package

An RPMS package is RPMS software intended for IHS and tribal distribution and implementation that is fully supported by the DSD. Each package is considered a component of RPMS and is assigned by the Director, DSD, to a development center for development and maintenance.

8.2.1.2 Non-RPMS Automated Information Systems Package

A software package not developed by an approved development center, and not supported by DSD, but may be for use within IHS.

8.2.1.3 Package Documentation

Package documentation is the information that describes the functions, implementation, use, maintenance, and distribution of RPMS packages.

8.2.1.4 Sensitive Information

Sensitive information is information that requires protection due to the risk and magnitude of loss or harm that could result from inadvertent or deliberate disclosure, alteration, or destruction.

8.2.1.5 Adobe Acrobat Reader/Exchange

Commercial software designed to bring electronic documents to a wide range of users. Cross-platform documents, which are created in Adobe Acrobat Portable Document Format (PDF), are called PDF documents. Acrobat Reader enables Windows and Windows NT, Macintosh, DOS, and UNIX users to review, navigate through and print any PDF document.

8.2.2 Mandatory Components

The three mandatory components of RPMS software documentation consists of:

- Installation Guide and Release Notes
- Technical Manual
- User Manual

8.2.3 Preparation

All RPMS software documentation will be prepared in electronic format using the Adobe Acrobat software (PDF format). The PDF file will be distributed as part of the national release and the file will reside as part of the archived distribution file.

8.2.4 Documentation Descriptions and Standards

8.2.4.1 Installation Guide and Release Notes

8.2.4.1.1 Purpose

The Installation Guide and Release Notes should provide sufficient information about the package and how to install the package without additional assistance from OIT. The Installation Guide and Release Note must contain, at a minimum, the mandatory sections listed below.

8.2.4.1.2 Title Page (Mandatory)

Identify the package by name, version number, and release date.

8.2.4.1.3 Release Notes (Mandatory)

Describe the packages functionality and benefits to the user. Also, describe, if applicable, any modifications and enhancements to the national package software

since prior release. This information is needed in advance of loading the software.

8.2.4.1.4 Installation Issues (Mandatory)

Provide an instructional guide for installing the software. Describe issues that should be considered prior to initialization and how to prepare for initialization.

8.2.4.1.5 Installation Instructions (Mandatory)

Describe the installation process in logical steps and include a statement recommending where the software should be loaded (e.g., "initially load software into a test account and then finally into the production account"). Note any routines, globals, etc., that may be removed from the system after completion of the installation.

8.2.4.1.6 Sample Install (Mandatory)

Include screen copies of the entire installation process as an example of a successful install.

8.2.4.1.7 Installation Configuration (Mandatory)

Provide guidance and suggestions for system configuration and global placement. List any requirements necessary for successful installation of the package. List any reference material that may be required during the installation process. List items that the installer should produce from the system after installation of the national package.

8.2.4.1.8 Required Resources (Mandatory)

Describe the resources required for the national package. Include Central Processing Unit (CPU) capacity, disk space, unique devices, and other pertinent resources. Provide a formula for sizing, if applicable.

8.2.4.2 Technical Manual

8.2.4.2.1 Purpose

Technical documentation should provide sufficient information about the software for programmers, ISCs and OIT technical personnel to operate and maintain the program applications without additional assistance from the package developer(s). The Technical Manual must contain, at a minimum, the mandatory sections listed below.

8.2.4.2.2 Title Page (Mandatory)

Include the name of the national software package, the version number, the preparation date, the name of the development center and the logo "IHS RPMS".

8.2.4.2.3 Preface (Mandatory)

Supply a brief statement identifying the document in terms of its purpose, scope and targeted audience.

8.2.4.2.4 Table of Contents (Mandatory)

Provide a table of contents with page references to major chapters and/or sections of the manual.

8.2.4.2.5 Introduction (Mandatory)

Include an overview that describes the package. The introduction should convey to the reader the major function(s) and purpose(s) of the package, and how the software accomplishes the objective(s).

8.2.4.2.6 Orientation (Optional)

Address package-specific notations or directions (e.g., symbols used to indicate terminal dialogues or user responses).

8.2.4.2.7 Implementation and Maintenance (Mandatory)

Provide information to assist the ISCs, OIT personnel, and PSGs in the implementation and maintenance of the national package. This section may include information regarding the entry of required site-specific data; a description of parameters configured to meet the needs of individual sites; sample configurations; and work sheets to assist in determining the parameters to be entered for the site.

8.2.4.2.8 Package Security (Mandatory)

A package security section will be created for controlling the release of sensitive information related to the national software package. This document will not be included in any Freedom of Information Act (FOIA) request releases. Distribution of this document is limited to the ISC and OIT personnel. Since certain keys and authorizations must be delegated for proper management of the system, information about these items may be found elsewhere in the technical and user manuals. The Package Security section must contain the following:

Exported Options
Provide a list of the options in the package. Indicate distribution of menus to users and note any restrictions on menu distribution.

FileMan File Access
Include the file access table in this section.

Security Keys
Provide a list of all security keys, a brief description for each, and information on who should be allocated to each key.

Electronic Signature
If applicable, provide any relevant information about the package's electronic signature capabilities.

Auditing, Journaling, Archiving, and Purging (Mandatory)
Describe any archiving, auditing, journaling or purging capabilities of the package and any necessary instructions or guidelines.

Sensitive Patient Tracking
Describe, if at all, how the package links with the Sensitive Patient Tracking package.

8.2.4.2.9 Routine Descriptions (Mandatory)

Provide a list of routines with comprehensive descriptions of the function.

8.2.4.2.10 File List (Mandatory)

Include a list and brief description of files that come with the package. The description should indicate what data comes with the file and whether or not that data will overwrite existing data, if applicable (this will normally apply only to VA packages since including data with a file is against IHS Standards).

8.2.4.2.11 Cross-references (Mandatory)

Provide a brief description of all cross-references exported with the package.

8.2.4.2.12 File Diagram/Flowchart (Optional)

For packages that include numerous files, provision of a chart representing the relationship among files is highly desirable.

8.2.4.2.13 Callable Routines (Mandatory)

List all entry points in the package that can be called by other applications. This list must include the actual entry points, a brief description of the function of these entries, a description of all required variables, and any restrictions on the use of the entry points.

8.2.4.2.14 External Relations (Mandatory)

Explain any special relations and agreements between the routines and/or files/fields in this package and the routines and/or files/fields in other packages. List any routines essential to the functions of this package, for example: Could an outpatient facility function without programming related to inpatient activity and avoid system failure? Specify the version of VA FileMan, VA Kernel, and other packages required to run the package.

8.2.4.2.15 Internal Relations (Mandatory)

Identify, if applicable, any routines, files or options within this package that cannot function independently of other programs. For example, Which menus can stand alone? Does the functioning of a particular option assume that entry/exit logic of another option has already occurred? List such options with their programming SACC approval dates.

8.2.4.2.16 How to Generate On-line Documentation (Mandatory)

Provide the file numbers and/or file number ranges, and namespaces along with any special templates. Inform the users where to find the Kernel documentation and how to print the data dictionaries and menu diagrams.

8.2.4.2.17 SAC Requirements/Exemptions (Mandatory)

Provide a listing of any items required by the SAC to appear in the Technical Manual. All exemptions granted by the SACC must noted specifying the date of the exemption and the actual exemption.

8.2.4.2.18 Glossary (Mandatory)

Provide a glossary of terms that relate to the specific national package.

8.2.4.2.19 Index (Optional)

Provide a package-specific index.

8.2.4.3 User Manual

8.2.4.3.1 Purpose

The User Manual is a document designed to be helpful to the user. This documentation will provide sufficient information for users to competently operate the national software package. Variability in the content is accepted, but at minimum, should contain a reference to all of the package functions and menu options. The User Manual must contain, at a minimum, the mandatory sections listed below.

8.2.4.3.2 Title Page (Mandatory)

Include the name of the software package, the version number, the preparation date, the name of the Development Center, and the logo "IHS RPMS".

8.2.4.3.3 Preface (Mandatory)

Supply a brief statement identifying the document in terms of its purpose, scope, and targeted audience.

8.2.4.3.4 Table of Contents (Mandatory)

Provide a table of contents with page references to chapters and/or sections of the manual.

8.2.4.3.5 Introduction (Mandatory)

Provide an overview that sets forth a description of the software package. Note related RPMS and/or VA manuals and other reference materials for a modular manual and the purpose for the individual module. Distinguish the major topics and issues within the package. The introduction should convey to the reader the major function(s) and purpose(s) of the package, and how the software accomplishes the objective(s).

8.2.4.3.6 Orientation (Optional)

Address any package-specific notations or directions (e.g., symbols used to indicate terminal dialogues or user responses).

8.2.4.3.7 Package Management (Mandatory)

Address unique legal requirements pertaining to the package and necessary security measures to protect the integrity of the package and its data (e.g., a package may use an electronic signature code or data that may not be changed because it is supplied by another agency). Package management should not be its

own section; the user manual should contain the information for package management.

8.2.4.3.8 Package Operation (Mandatory)

Describe what the user needs to know in order to competently operate the package. Package operation should not be its own section; the entire user manual should describe how to use the software package. The information should include how the user can access on-line documentation.

8.2.4.3.9 Glossary (Mandatory)

Provide a glossary of terms that relate to the specific package.

8.2.4.3.10 Index (Optional)

Provide a package-specific index.

8.2.4.4 Users Guide to Computing

The *Users Guide to Computing* has been adopted as a stand-alone instructional guide for general computer usage. This guide describes programming conventions common to all national packages and is to be used as a reference source.

8.2.4.5 Patch Documentation Requirements

8.2.4.5.1 Notes

All patches to certified RPMS software require a notes file outlining system requirements, contents of the distribution, modifications to the software, reason for the patch, etc. Developers should follow the format outlined in Notes File procedure elsewhere in this handbook.

8.2.4.5.2 Patch User Manual Addendum

If a patch contains changes to how a user will interface with the package or contains new or altered functionality, a user manual addendum may be distributed with the patch. The addendum should contain enough information so the user can operate the package after the patch is installed. If the patch is cumulative of previous patches, so must the patch addendum of previous addenda.

8.2.4.5.3 Patch Module Entry

Each patch to a certified RPMS package will be entered into the IHS Patch Module by the responsible developer. In addition, another developer is responsible for completion of the patch prior to review and verification by SQA.

8.3 Documentation Style Standards

The following style standards are provided to promote consistency in IHS RPMS package documentation. To meet the Documentation Style Standards, all documents must follow and meet the style guidelines outlined here and in the OIT Documentation Style Guide (separate document).

8.3.1 Dates

Use the release date (Month Year format) on the title page and in the document footer.

8.3.2 Version Number

Spell out and capitalize (or initial cap) the word *version* when used on the manual cover (e.g., Laboratory Version 5.0). Abbreviate *version* to a lower case *v* without a space when used in the header or footer (e.g., Laboratory v5.0). Do not use a period or a space after the *v* when abbreviating *version*.

8.3.3 Headers and Footers

Headers and footers are required for all manuals. The information contained in the header is the package name, package namespace, and version number. The information contained in the footer is the manual type, the page number, the chapter or section name (level 1 heading only), and the release month and year.

The title page should not have a header or footer at all. Lines separating the header and footer from the text are mandatory.

8.3.4 Margins

All documents should contain 1-inch margins on all sides. Certain pages, like externally created flowcharts and graphics can be exempted from this restriction when necessary.

8.3.5 Using Styles

Styles streamline the updating and formatting process of documentation. Use styles to align and format text whenever possible. When using styles, make as few manual adjustments as possible, but also avoid making an unnecessary number of new or specific styles. The use of styles is required to comply with Section 508, as it permits more accurate tagging by the Adobe Acrobat program.

8.3.6 Page Dimensions

All documents will be created for an 8.5- inch by 11-inch page in portrait orientation when possible.

8.3.7 Package Names

Use initial capitalization when referring to package names (e.g., Laboratory, Patient Registration). When you refer to the package for the first time, spell out the full package name and follow it with the abbreviation or namespace in parentheses. After you have introduced a package in this fashion, you may refer to it by just the abbreviation or synonym throughout the document. Always use the word *package* when you are referring to a package, but do not capitalize *package* (unless the entire phrase is initial capped, such as in headings).

8.3.8 Text Alignment

In most cases, text is to be presented flush left or justified with no paragraph indents and no hyphenation.

8.3.9 Standard Font and Type System

Use Times New Roman 12-point font for standard documentation text.

Use Arial 12-point font to indicate user input. You may also use **Arial 12**-point bold for user input. Be consistent throughout a document.

Example: Type PTRG at the main menu prompt.

Example: Type **PTRG** at the main menu prompt.

Use `Courier New 10`-point font to indicate computer messages or recreate computer screens. Recreated screens should also be boxed with a 1-point border and slightly shaded.

Example: The `Patient Has Been Added` message displays.

8.3.10 Italic Type

Use italic type for small areas of emphasis. When referring to a word as a word, use italics to set the word apart from the rest of the text.

Example:
The word *prompt* usually refers to a system question that appears on your screen.

8.3.11 Underlined Type

Underlined type is not generally used. Do not use underlining to emphasize particular sections of text or set headings apart from the text. These types of emphasis are done more professionally with font style, font size, bolding, placement, or italics.

8.3.12 Bold Type

Bold type should be used sparingly and only after other means of emphasis have been exhausted (moving text to beginning or end of a paragraph, etc.). Bold type can and should be used to emphasize headings, easing navigation.

8.3.13 Heading and Subheading Alignment

Place all headings and subheadings at the left margin. Do not indent incrementally with the heading level.

8.3.14 Heading Font

Distinguish headings with font size, font type (Arial), bold weighting, or italics. Do not underline headings. (The Heading 1-Heading 4 styles in this document meet the standards and can be transferred to your document through the Style Organizer.)

8.3.15 Page Numbering

Pages should be numbered in standard format, starting with page 1 at the Introduction. The only exceptions to this numbering system are the table of contents, acknowledgement, and preface. These pages should be numbered with lowercase roman numerals (i, ii, iii, iv, v, etc.). The title page should not be numbered at all.

8.3.16 Figure Numbering

Figures should be numbered in the 1-1 format, where the first number corresponds to the section number and the second number corresponds to the figure number within

that section. For example, the first figure in section one would be Figure 1-1, the third figure in section two would be Figure 2-3, etc. The figure number will appear in the figure caption. For more on figure captions, see section.

8.3.17 Item/ List Numbering

Items in lists should be numbered ONLY if the items must be completed in a particular order or if the numbering is critical to understanding the list or items. In cases where there is no explicit reason to use a numbered list, use a bulleted list instead.

8.3.18 Heading Numbering

All headings between heading 1 and heading 4 will be numbered in legal/outline style (1.0, 1.1, 1.1.1, 1.1.1.1, etc.).

8.3.19 Standard Page Breaks

Insert a Section Break (Next Page) between the title page and the table of contents and before all level 1 headings. Unless you have a very good reason to include section breaks before other heading types (in a reference guide where pages must stand alone, for example), do not use section breaks elsewhere in the document.

8.3.20 Hard Page Breaks

Do not use hard page breaks to keep text together across a natural page line. Instead, set the Keep Lines Together or Keep With Next paragraph properties to *on* and allow the Word program to determine the best place to break the text.

8.3.21 Forcing Even and Odd Start Pages

Do not use the Section Break (Odd Page), or Section Break (Even Page) options when inserting section breaks. All OIT documentation is designed to be viewed onscreen (according to the Paperwork Reduction Act of 1996) and extra pages included to start sections specifically on even or odd pages only complicates online reading. In addition, users who chose to print a paper copy of the manual do not always have access to printers that allow double-sided printing. In these cases, you are forcing users to print unnecessary blank pages.

8.3.22 Referring to Multiple Appendices/Appendixes

While many dictionaries consider both *appendices* and *appendixes* correct terms for referring to more than one appendix, OIT will use the more conservative and recognizably correct *appendices*.

8.3.23 Appendix Titles

Appendices should be treated independently and lettered accordingly. To assist users in navigating appendix information, all appendices will be labeled/ titled in the following format.

Example: 11.0 Appendix A: List of Names

This format allows users to find appendix information by the section number, the appendix letter reference, or the content. Do not use a hyphen or em-dash between the appendix letter and the description/ title.

Problem: 11.0 Appendix A— List of Names

Solution: 11.0 Appendix A: List of Names

8.3.24 Appendix Location

Appendices should placed after the Glossary but before the Contact Information section.

8.3.25 Screenshots

8.3.25.1 Using Screenshots as Figures

If a screenshot represents a complete page or pop-up dialog box, it should be treated as a figure. If a screenshot represents only a portion of a page or pop-up dialog box, it can be treated as a figure at the writer's discretion. If the majority of your screenshots are partial ones or they are referred to heavily in the text, it is best that they be treated as figures.

8.3.25.2 Using Default Settings

As much as possible, use the default settings for the desktop when you take a screenshot. For GUI screenshots, include the window frame when you are taking a screenshot of the window (when space allows). For roll-and-scroll screenshots, do not include the window frame, as many users are using dumb terminals and do not have an awareness of the RPMS system in a windowed environment.

8.3.25.3 Screenshot Border

Do not use drop shadow or any other special graphic effects on screenshots. If necessary, screenshots should be assigned a ½ point single solid line border.

8.3.25.4 Screenshot Authenticity

Screenshots should appear as close as possible to what the user really sees onscreen. Cropping for the sake of space in acceptable as long as the user can still use the image to orient him/herself on the screen.

Do not make any unnecessary changes to spelling, grammar, etc. in text capture screenshots. Do not use a photo editor to cleanup or alter a screenshot unless you are altering sensitive information. Make sure that you review your screenshots before the final product is packaged to make sure that any last minute changes to the program still match your documented screenshots. Callouts and sample dialog between a hypothetical user and the system should not be so subtle that the user expects them to appear on his or her screen when he or she follows your instructions.

8.3.25.5 Screenshot Alt Text

All image screenshots (not text-capture screenshots) must have an alt text value set through the Web tab in the image Properties box. This alt text value must explain that the user is missing a screen shot and explain to the user what is generally being displayed. This element is required to comply with Section 508.

Problem: [alt text] Viewing a patient's insurance information.

Solution: [alt text] This screenshot illustrates which menu option to select to view a patient's insurance information.

8.3.25.6 Screenshots as Alternate Content Only

Per Section 508 regulations, screenshots/images cannot contain information that is not contained elsewhere in the document. If you use a screenshot to illustrate which values to enter at a series of prompts, you must also include that information textually in that section. This does not apply to text-capture screenshots, as the information is not actually in image form, it just appears to be.

8.3.26 Callouts

8.3.26.1 Callout Text

When creating callouts on image capture screenshots, use the text box function in Word to create callout text boxes. Use standard capitalization in callout text. Do not change or remove the text box border. Try to position the text box so it is not covering important information. Attempt to position the callout in a blank area, if possible.

8.3.26.2 Callout Lines

When visually linking callout text with the section of the image it applies to, use straight horizontal and vertical lines when possible. Diagonal lines will appear jagged. Be aware that straight callout lines may not be very clear if they closely parallel the lines around the screenshot.

Keep callout lines as simple as possible. Try to restrict callout lines to one straight line. If that is not possible, create two lines that meet at a perpendicular angle. Do not create callout lines that fold back on themselves. Callout lines should have an arrow head on the end closest to the text the callout refers to. All arrows should go from the callout text box TO the related screenshot section.

8.3.27 HHS and IHS Logos

The HHS and IHS logos must be included on the covers of all documentation. These logos should be of equal size and should be placed in a balanced fashion on the title page only.

8.3.28 Image Accents

Do not use decorative images to convey information types. For example, many older RPMS manuals include a small book and pen graphic next to notes. This addition is only a distraction and a file size hog. Use textual elements (borders, shading, bolding, etc.) to emphasis notes, cautions, and warnings instead.

8.3.28.1 Placement of Figures

Figures should be placed after the first reference to them. Figures should not be placed against each other without text to buffer them unless they are representing consecutive pages of a screen or report and there is no text to place between them.

8.3.28.2 Placement of Tables

Tables should be placed after the first reference to them. Tables should not be placed against each other without text to buffer them.

8.3.28.3 Caption Contents

Figure captions should include the figure number, the figure description, and reference to any step numbers that are covered in the figure.

Example:

Figure 3-30: Adding a new patient (steps 2-4a)

8.3.29 Referring to Acronyms

On first appearance, spell out the acronym and define it, if necessary, then include the acronym in (). If the acronym is the more standard usage, include the full text in the parenthesis and use the acronym. After the first usage, use only the acronym without the parenthetical explanation. All acronyms should appear in the glossary with the full phrase defined (minimum) and the definition if it will be helpful to the users.

8.3.30 Capitalization

In general, you should capitalize:

- All letters in acronyms
- The initial letter of the first word in a list
- The initial letter of the first word in a callout
- The initial letter of a key name
- The initial letter of a sentence. Avoid starting a sentence with a command name or application name if it has a lowercase initial letter.

Do not capitalize:

- When you want to emphasize something
- Names of variables

8.3.30.1 Capitalization of Key Names

Match capitalization on the keyboard. Do not capitalize the word *key* when it follows the name of a key.

Problem: Press the Return Key.

Solution: Press the Return key.

8.3.30.2 Capitalization of Field Names

You can either match the onscreen capitalization of field names or just capitalize the first letter of each word, as long as you maintain a consistent approach to the entire document. Do not use all capital letters to indicate field names unless that is how they appear on the screen and you have decided to follow the onscreen capitalization. If there are a lot of fields to refer to and they are all heavily capitalized, following the onscreen capitalization is highly discouraged, as too many capital letters make a document difficult to read.

8.3.30.3 Capitalization of File Names

Use initial caps for all file names, but do not capitalize the word *file* when it follows the file name. The word *file* must follow all references to file names to distinguish file names from option names.

8.3.30.4 Capitalization of Option Names

Use initial caps for all option names, but do not capitalize the word *option* when it follows the option name. The word *option* must follow all references to option names to distinguish option names from file names.

8.3.31 Using Punctuation as Commands

Many of the RPMS packages use punctuation marks as command and navigational responses. When a punctuation mark is used in this context, you must spell out the name of the mark and give a parenthetical example immediately following.

Example: Type a question mark (?) at the "Name" prompt to see a list of options.

Example: Type an ellipses (…) at the "Replace:" prompt to select all of the existing text for replacement.

Example: Type a caret (^) at the "Device:" prompt.

8.3.32 The Return/Enter Key

When instructing the user to press the Return or Enter key, use the phrase, "Press the Return key." Notice that the phrase uses the word *press* instead of *hit* or *strike*. Also make sure that you capitalize the key name as it appears on the keyboard and follow the name of the key with the word *key*. Do not use any additional punctuation or formatting to make the Return key reference stand out. You may use either the Enter key or Return key, but use them consistently throughout your documentation.

Problem: Press RETURN.

Problem: Hit return.

Problem: Hit <RETURN>.

Solution: Type your name and press the Return key.

Exception: When making notations in a recreated computer screen example, the notation **<RET>** or **[RET]** is an acceptable way to indicate where the Return key was pressed. This Return key symbol should not be underlined, but should be bolded.

8.3.33 The Caret (^)

Within RPMS packages, the caret has navigational properties and is referred to frequently in the manuals. You can refer to this punctuation mark as the caret, up-hat, or circumflex, but never as the up-arrow. When referring to this punctuation mark, always include an example in parentheses.

8.3.34 Keystrokes

Keys that the user is supposed to press are referred to by an article before the key name and the word *key* after the key name. Key names should not be set in bold text simply because they are key names.

Problem: Press **RETURN.**

Solution: Press the Return key.

Use a hyphen to connect keystrokes that are performed simultaneously. If necessary, explain this notation in the orientation section of the manual.

Example: Ctrl-D [press the Ctrl key and the D key simultaneously]

Use a comma and space to separate keystrokes that are pressed in sequence.

Example: Press Ctrl-Shift, N to display the New window. [Press the Ctrl key and the Shift key at the same time, then release and press the N key.]

8.3.35 Introducing Procedures

To introduce a series of procedure items, use a complete sentence ending with a colon and follow the same grammatical pattern for all introductions in a document.

Example: To print the document, follow these steps:

8.3.36 Describing User Selections

Describe selections in the order the user makes them.

Example: Select the File menu, then select the Open option.

8.3.37 Referring to System Prompts

Use double quotes around prompts used within the text. Use single quotes within double quotes only. Don't use quotes around prompts in a recreated computer dialogue (screen shot).

The word *prompt* must follow all references to prompt names to distinguish them from files or options. When directing the user to type a response to a prompt, always follow the user instructions with the prompt name. If the prompt has any internal punctuation, include that in the prompt name reference.

Many prompts in RPMS are followed by a default response. Default responses are not uniform throughout the IHS and are not part of the actual prompt. Do not refer to the default response when using prompts within the text.

8.3.38 General Word Usage Guidelines

- Define new terms that are not listed in a regular dictionary the first time they appear in the text. You should include these terms in the glossary as well.
- Do not use slang or undefined jargon.
- Do not use terms that have several different meanings.
- Use your defined terms consistently throughout your documentation. Do not use synonyms.
- Ensure that your spelling is correct.
- Avoid general adjectives that can be misinterpreted. For example, "the user-friendly Windows desktop" could mean that either the desktop is user-friendly or that Windows is user-friendly.

8.3.38.1 Allow

Avoid using the word *allow* when referring to software features. Allow implies permission. Either rewrite the sentence or use the word *enable*.

8.3.38.2 Appear (verb)

Use the phrase *is displayed* instead of the word *appears*.

8.3.38.3 Blank

When no information is present in a field, refer to the field as blank. Do not use *empty* when you refer to a field.

8.3.38.4 Choose

Avoid using the word *choose*. *Select* is usually more explicit.

8.3.38.5 Enter (verb)

When you are instructing the user to type specific information into specific fields, use the word *type* instead. Use *enter* when referring to higher-level or general functions.

Example: Use the Patient Registration Menu option to enter patient data into the system.

Example: Type the patient's full name at the "Select Patient Name:" prompt.

8.3.38.6 Field

A part of the interface where users can type information to add data to or search a database. Also referred to as *prompt*.

8.3.38.7 Hit (verb)

Use *press* instead of *hit* (or *strike*).

Problem: Hit the Return key.

Solution: Press the Return key.

8.3.38.8 Pick (verb)

Use *choose* or *select* for selecting things from menus.

Problem: Pick the option you need from the menu.

Solution: Select the option you need from the menu.

8.3.38.9 Press (verb)

Use *press* for keyboard actions. Use *click* for GUI actions.

Example: Press the Enter key to continue.

Example: Click the Apply button.

8.3.38.10 Type

Use *type* instead of *enter*. Do not use *type in* or any other variation on the word *type*.

Problem: Enter your name to start the program.

Problem: Type in your name to start the program.

Solution: Type your name to start the program.

9.0 Appendix G: IHS RPMS GUI Standards

9.1 Purpose

The purpose of these GUI Standards is to promote visual and functional consistency in RPMS GUI software. This document defines user interface and programming standards to follow when programming in a Graphical User Interface (GUI) environment.

9.2 General Specifications and Guidelines

All IHS RPMS GUI software designed to execute in the Microsoft Windows operating environment will comply with the specifications and guidelines defined in *Windows User Experience*, Microsoft Press, 2004: ISBN 0735605661 and with the IHS-specific extensions embodied in this document. *Windows User Experience* may be purchased in book form or viewed online at *Official Guidelines for User Interface Developers and Designers* (http://msdn.microsoft.com/library/default.asp?url=/library/en-us/dnwue/html/welcome.asp) on the Microsoft Developer's Network website.

9.3 IHS Programming Naming Conventions

1. All IHS applications submitted for verification must contain all source code associated with the application. This section defines how a developer should name various elements, modules, forms, variables, routines, classes, web services, etc. to allow reviewers to follow the logic of the application.

2. All IHS applications submitted will include a detailed statement indicating the Development Tools (IDE) used to create the application. The statement will include the version, manufacturer, and development language.

3. All IHS applications submitted will include a detailed statement indicating the dependencies required to run the application. The statement will include the each dependency, its version, manufacturer, and description.

4. All IHS applications submitted will include a detailed statement indicating the Windows OS required to run the application. The statement will include all versions supported and minimum operational requirements.

5. IHS applications source code will have consistent and standard comment formats.

6. Explicit dimensioning of data types is required. Strong Naming Encryption is required for .Net assemblies.

7. Use of commercially purchased controls requires SACC approval through the Request for Exemption process. The request must also contain the manufacturer's licensing and deployment agreements.

8. The application must support error handling techniques to prevent unhandled exception messages to occur.

9. Use of Hungarian prefix notation is strongly recommended to designate variable type and scope. E.g. "strName"

10. Use of the Microsoft "camel-case" notation is strongly recommended. E.g. "PatientName" Use an "Object-Verb" notation.

11. Applications should support user defined window and themes. Applications should not override user selection of fonts, colors, size, and resolution. Applications should adhere to the 508 Section of the Rehabilitation Act.

12. An About Form must be present in all GUI applications and will show the current version of the product along with the current version of all dependent products. Whenever a dependent product is upgraded and used with the primary product, both the dependent product version and the primary product version must be incremented.

13. All IHS GUI applications will have a robust on-line HELP context.

9.4 File Systems

1. IHS GUI applications will install themselves into an application subdirectory descendant from the system-defined "Program Files" directory. The first subdirectory descendant below the Program Files directory is "Indian Health Service". All applications certified by IHS will be in descendant subdirectories of "Indian Health Service".

2. IHS GUI applications will make use of locations (and localized names) of standard system folders. Any application that registers a COM Object will register the object in the application subdirectory. Registering a COM object in any other Windows' directory requires exemption from the SACC.

3. IHS GUI applications will make use of locations (and localized names) of temporary storage directories based on the environmental variables defined by the system. (Example: the temp folder may be C:\TMP).

4. IHS GUI applications that create permanent files such as INI files will store such files in folders descendant from their application folder.

5. IHS GUI applications that create files containing sensitive data must hash or encrypt such data if the data is to remain on the users system. IHS GUI

applications will remove any temporary stored sensitive data upon closing the application session. IHS GUI applications will delete any files containing sensitive data that may exist from an abnormal shutdown of the previous application session.

6. Files containing sensitive data must adhere to the Security section 9.7

9.5 Installation

IHS GUI applications will supply an installation package which supports the Windows Installer and which adheres to the *Windows User Experience* guidelines for installation and un-installation. The installation package will be namespaced according to the officially assigned application namespace. All temporary and permanent data storage files will be removed during un-installation.

9.6 Namespacing

9.6.1 COM Objects

1. IHS applications that register COM objects on the system must show the Product Name, Internal Name and Version when the object's properties are displayed.

2. The Product Name contains the product's descriptive name.

3. The Internal name contains the application specific namespace assigned by the DBA.

4. The Version must contain both major and minor numbers and must increment with each release. A modification to a RPMS Remote Procedure call or RPMS routines related to the object requires that a new object be created with the matching version number associated with the RPMS change.

5. The technical manual must identify all objects submitted to verification including dependencies. Identity must list the product name, the internal name and the version number.

9.6.2 .Net Objects

1. .NET Assemblies developed for IHS using the .NET framework will be created under the IndianHealthService namespace.

2. .NET created objects must contain property information as described to COM objects described in section 9.6.1

9.6.3 RPMS Kids Files

Each new or patched object within an application will result in a unique Build File entry. The major part of the release version must coincide with the major release version of the client package distribution. (NN.NN – Major and minor version number of the namespace associated with the Windows application/object - This is the value that is placed in the Current Version field of the Package File.) Each time OIT Verification releases a distribution associated with the package namespace and the major part of the number changes (NN before the dot) all dependent client files of the namespace will be released with the same proper increment.

9.6.4 Client Naming Conventions

Client side software generally is identified by the extension of the file name. EXE- identifies the application as an executable program. DLL- identifies the application as a dynamic link library. OCX- identifies the application as an active X control. BAT- identifies the application as a batch run type program.

When the properties of the file are viewed, the version number must be clearly identified. Newer or patched releases of this file must be identified with a new name or an incremented version number. The major part of the release version must coincide with the major release version of the kids package distribution. (NN.NN – Major and minor version number of the namespace associated with the Windows application/object - This is the value that is placed in the Current Version field of the Package File.) Each time OIT Verification releases a distribution associated with the package namespace and the major part of the number changes (NN before the dot) all dependent client files of the namespace will be released with the proper increment.

9.7 Security

9.7.1 Data Storage on Client

1. Data such as default settings and previous used values can be stored on the client however no sensitive data or data associated with maintaining security can be stored on a client without SACC approval through the Request for Exemption process. IHS GUI applications that create files containing sensitive data must hash or encrypt such data if the data is to remain on the users system. IHS GUI applications will remove any temporary stored sensitive data upon closing the application session. IHS GUI applications must check and delete any files containing sensitive data that may exist from an abnormal shutdown of the previous application session.

2. If data is to be stored in a registry setting, then specific settings and directions to support trust relationships to the registry is required in the technical documentation.

3. If data is to be stored in a file, then specific directory settings, ownership details, and directions to support trust relationships to the file and directory is required in the technical documentation.

9.7.2 Broker Interface

1. Any RPMS database access must use a SAC approved broker for communication. Access by any other means requires SACC approval through the Request for Exemption process.

2. The GUI application must use the approved Kernel access controls when establishing a connection. The access/verify data will be hashed or encrypted.

3. GUI applications must use published Remote Procedure calls for security access, patient context and visit context. Access by any other means requires SACC approval through the Request for Exemption process.

4. The broker listener interface port used is subject to IHS DBA assignment.

10.0 Appendix H: Data Dictionary Field Numbering And Data Placement Conventions

The following conventions for numbering fields, and placing data in pieces, is extracted from a mail message dated 25 Feb 88, and is considered to be those conventions referred to in the Programming Standards And Conventions paragraph which states "Field numbers for FileMan files will be assigned in accordance with established conventions."

1. There is a direct correlation between the field number and the node and piece, and for multiples, between the field number and the sub-file number.

2. Fields beginning with a "." are all .01-.n and are in the 0th node. Where possible, files only have a 0th node. This reduces the number of disc accesses required. A field number must be canonic, therefore, there is no .10 field. It goes from .09 to .11. That means piece 10 will always be NULL.

3. Where the entire entry cannot be put in one node, there are more nodes, generally grouped by logically related fields into field numbers within some range, say 1101-1116. These would be node 11 piece 1-16, and in this case piece 10 is allowed because it is canonic.

4. Multiple fields are always 4 digits. The first two digits are the next higher group, using the example above, 11 would be the next higher group. The second two digits are always 00. The subscript for that multiple is always the first two digits of the multi-valued field number. 11 in this case. The sub-file number is always the parent file number with the first two digits of the multi-valued field number appended. If we were in file 9000001 in the above example, the sub-file for field 1100 would be 9000001.11, and the subscript would be 11. Now, if we added a multiple to that sub-file, as say field number 1500, its sub-file would be 9000001.1115 and its subscript would be 15. In the data global it would look like ^AUPNPAT(DA(1),11,DA,15,0). The assigning of sub-file numbers is important, because if you let FileMan do it, he will assign numbers that may fall within the number space of primary files using our file number assigning logic.

5. There are special cases that do not follow the rules, of course. On most of the pointed to files, we have added a field number 9901 MNEMONIC which is used on a site by site basis if you have a very high percentage of your lookups to two or three entries, you can add data to the MNEMONIC field, say 1, 2, and 3, and instead of responding CLAREMORE to a LOCATION lookup, you can respond 1. This field is in node 88 piece 1. It is 8801 so the MNEMONIC field would be the same number in all dictionaries, regardless of how many fields, and field numbers, a particular file had already.

6. Computed fields, where ever possible, immediately follow the field from which they are computed, and the computed field number is the same as the real field followed by a 9. If the field above was .12 the computed field would be .129. If you wanted more than one computed field off of .12 they would be .1291 and .1292.

7. There is another class of computed field. That is a computed field that points back to the VA PATIENT file. Those fields have a .2 following the field number. That indicates it is not really a computed field, but just a pointer back to the VA PATIENT file.

Filename: SAC_2005.doc
Directory: E:\Documents and Settings\mhamel\Local Settings\Temporary Internet Files\OLK174
Template: C:\Documents and Settings\jtorrez\My Documents\security\2005 Policies\sop_template2.dot
Title:
Subject:
Author: jtorrez
Keywords:
Comments:
Creation Date: 7/27/2005 7:26:00 AM
Change Number: 55
Last Saved On: 9/7/2005 2:57:00 PM
Last Saved By:
Total Editing Time: 380 Minutes
Last Printed On: 9/22/2005 7:31:00 AM
As of Last Complete Printing
Number of Pages: 93
Number of Words: 21,833 (approx.)
Number of Characters: 124,449 (approx.)